THE Journal OF THE AMERICAN DENTAL ASSOCIATION

JULY
1957

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NINETY-EIGHTH ANNUAL SESSION

VOLUME 54
NUMBER 1

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98th Annual Session of the A.D.A.
Miami - Miami Beach, November 4-7, 1957

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AMERICAN DENTAL

ASSOCIATION

NOVEMBER 4-7, 1957

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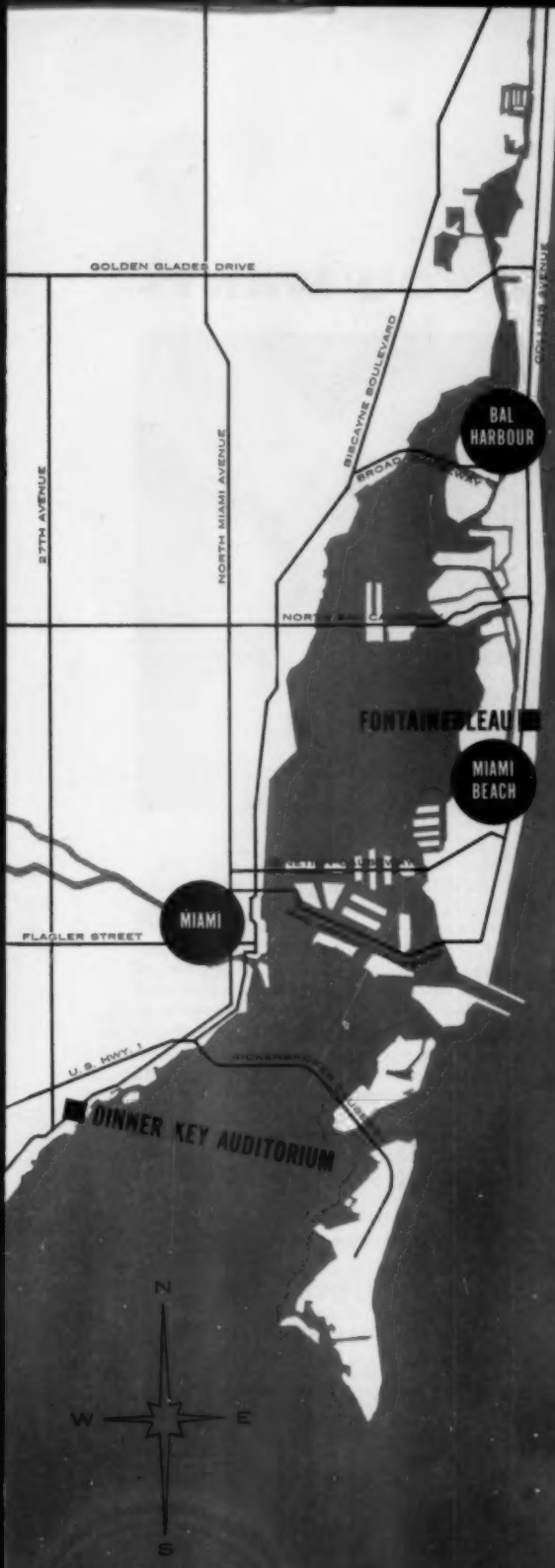

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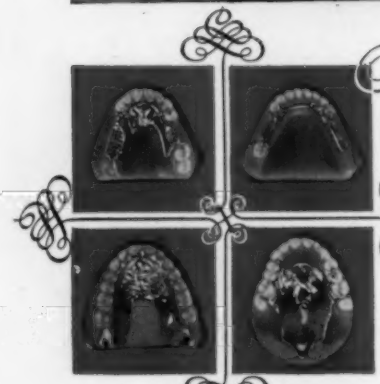

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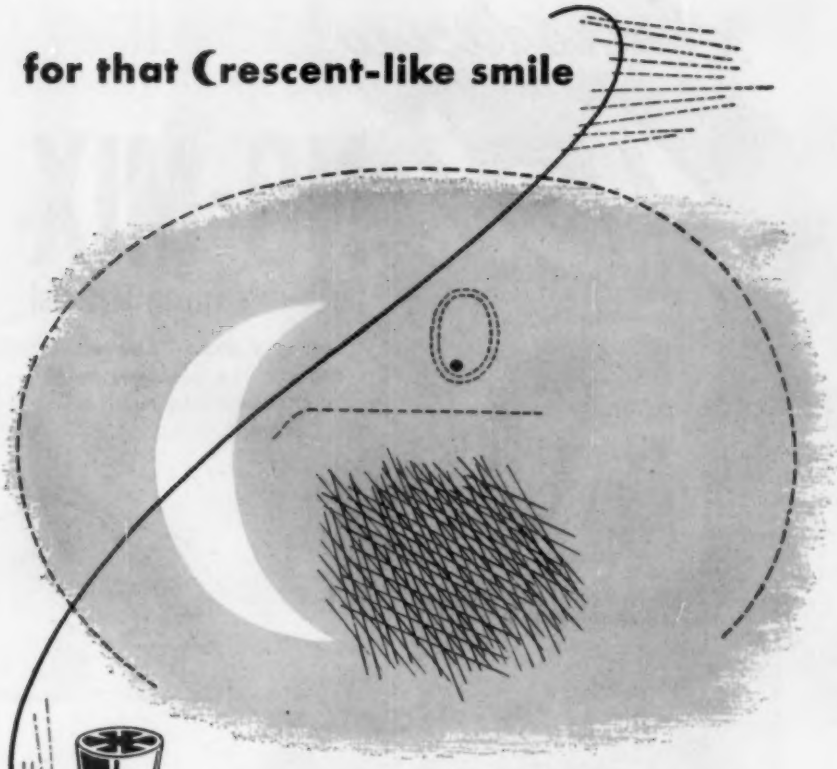

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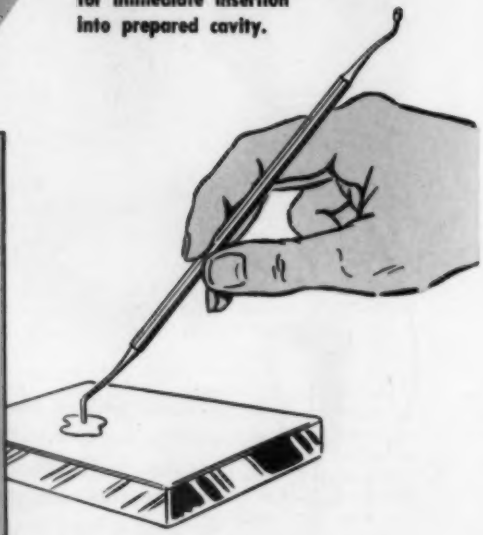

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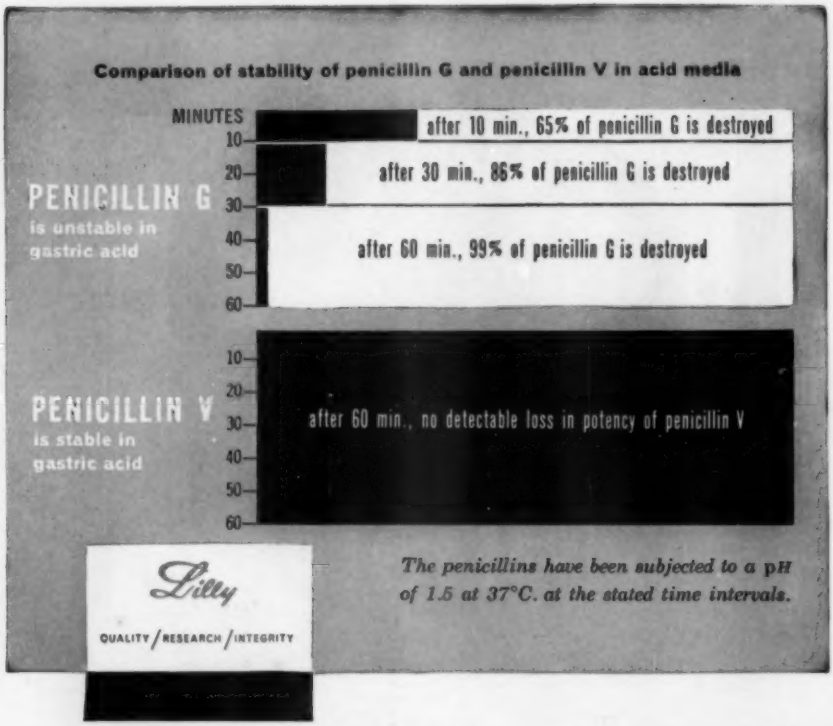
Comparison of stability of penicillin G and penicillin V in acid media
MINUTES
10
20
30
40
50
60
PENICILLIN G
is unstable in gastric acid
after 10 min., 65% of penicillin G is destroyed
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THE PATIENT
NOT THE
DENTURE!

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JULY, 1957

Dental supply houses a hundred years ago went far afield, it seems, for their material, as this advertisement from National Gazette and Literary Register of December 9, 1833 shows:

TO DENTISTS

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* * *

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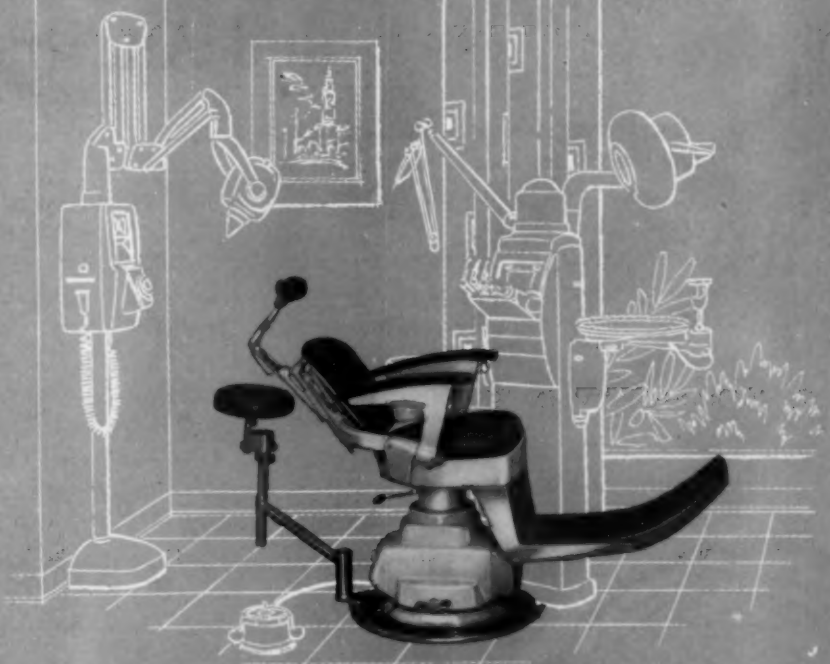

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JULY 1957 THE Journal OF THE AMERICAN DENTAL ASSOCIATION VOLUME 55 • NUMBER 1

Dental survey of Philadelphia preschool children by income, age and treatment status

J. M. Wisan, D.D.S.; Martha Lavell,† M.S.S., and F. Herbert Colwell,‡ Dr.P.H., Philadelphia*

Epidemiological studies of dental caries among preschool-age children (two to five years of age) have not been as numerous as have those made of school-age children.[1-3] Consequently, extensive data on DMF rates among school-age children are available, but def data for children two to five years of age are lacking, particularly for appraising dental conditions in different segments of the population.

The lack of data on deciduous teeth may reflect the general lack of interest in dental care during preschool years. This lack of interest is regrettable in view of the importance of the deciduous teeth for long-term dental health of the population. Kaufman, when he introduced the term "foundation teeth," did so in order to emphasize to the public that early dental care for these teeth was indispensable. Brauer,[4] McBride,[5] and Hogeboom[6] among others point out the value of properly treating deciduous teeth.

When the Philadelphia Health and Welfare Council, the Philadelphia Department of Public Health, and the Philadelphia County Dental Society organized a workshop to study procedures to improve dental care of preschool children,

*Chief, dental health section, Philadelphia Department of Public Health.

†Statistician, Philadelphia Department of Public Health.

‡Director, office of statistics and research, Philadelphia Department of Public Health.

1. Pelton, W. J., and Wisan, J. M. Dentistry in public health, ed. 2. Philadelphia, W. B. Saunders Co., 1955, p. 61, 62.

2. Savara, B. S., and Suher, Theodore. Incidence of dental caries in children 1 to 6 years of age. J. D. Res. 33:808 Dec. 1954.

3. National Academy of Sciences—National Research Council. Survey of literature of dental caries. Washington, D. C., National Academy of Sciences, National Research Council, 1952, p. 133-135.

4. Brauer, J. C., and others. Dentistry for children, ed. 3. Philadelphia, Blakiston Co., 1952, p. 300, 301, 362-364.

5. McBride, W. C., and others. Juvenile dentistry, ed. 5. Philadelphia, Lea & Febiger, 1952, p. 304, 310.

6. Hogeboom, F. E. Practical pedodontia, or juvenile operative dentistry and public health dentistry, ed. 6. St. Louis, C. V. Mosby Co., 1953, p. 123-125, 127-139.

the first step was to obtain information on existing dental conditions in this age group.

SURVEY METHODS

The council on dental health of the Philadelphia County Dental Society appointed a subcommittee to organize a survey of dental conditions among preschool children. Private dentists, dentists in hospital clinics and dental schools, and staff dentists of the Philadelphia Department of Public Health cooperated in the survey. The total number of participating dentists was 78, of whom 29 were in private practice.

Dentists in private practice were asked to examine preschool-age children who came as patients to their offices; the other dentists examined children in kindergartens, day nurseries, housing projects, and clinics. The dentists were guided in the survey activity by one of the authors (J.M.W.).

All examinations were made with mouth mirror and explorer, and findings were noted on the chart (Fig. 1). Ages of the children were recorded according to the last birthday. The data were then coded and recorded on IBM punch cards under the direction of one of the authors (M.L.).

POPULATION STUDIED

The population surveyed was divided first into those who were currently obtaining

CHART

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	
U				I	II	III	IV	V	VI	VII	VIII	IX	X				U
L				XX	XIX	XVIII	XVII	XVI	XV	XIV	XIII	XII	XI				L
	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	

Right Left

Arabic numerals indicate permanent teeth 1—32
Roman numerals indicate deciduous teeth I—XX

CODE

Permanent teeth		Deciduous teeth
N	Neither decayed nor filled	n
D	Decayed requiring filling	d
MR	Decayed requiring extraction	e
MP	Previously extracted	—
F	Filled—normal	f
FD	Filled—requiring new filling	fd
FMR	Filled—requiring extraction	fe
U	Unerupted	u

Fig. 1 • Chart and code for recording used in survey

dental care and those who were not. The latter group is herewith referred to as nonpatients, although some may have been obtaining treatment without the knowledge of the investigators. A further division was by income. In the first group, patients of private dentists and dental clinic patients were contrasted. Since most patients going to private offices are from higher income homes than are the clinic patients, among these children the relationship of dental disease to economic status may be observed.

The children in the group of nonpatients were examined in day nurseries, kindergartens (public and parochial), and housing projects. Division by income in this group was somewhat arbitrary. Because certain of the kindergartens were located in high-income areas of the city, they were presumed to accommodate high-income families. The location of the other kindergartens and the housing projects indicated medium-to-low income groups. The distinction here is a rough one but it would seem to be justified in the light of data herewith presented.

Children in day-care centers or day nurseries were all presumed to belong in the medium-to-low income group. Also included in the medium-to-low group were 103 children who were motivated to attend a Health Department clinic by the offer of sodium fluoride treatments and 158 children who were pediatric patients in the Philadelphia General Hospital. Neither of these groups was currently seeking the treatment of dental defects.

The number of children in each group was as follows: private office patients, 196; clinic patients, 674; high-income nonpatients, 476; medium-to-low income nonpatients, 1,331. These four groups combined made a total of 2,677 children surveyed.

The sexes were evenly represented: 50.4 per cent of the group was male. The group was 72.1 per cent white; this proportion is more than in the elementary school population of Philadelphia, which is 62 per cent. (The proportion of white to nonwhite children in the preschool-age population of Philadelphia is not available.)

RESULTS

The results will be presented in terms of comparison of age groups, income groups, patient and nonpatient groups, and racial groups (Figures 2-4 and Tables 1 and 2).

In presenting the data the following abbreviations will be used throughout, referring to the various groups:

PO—private office patients

Cl—clinic patients

H—high-income nonpatients

M-L—medium-to-low income nonpatients

The results singled out for reporting are confined for the most part to the five year old group, as the other groups were smaller and less likely to be of statistical significance. In all instances when a percentage difference is indicated to be statistically significant, the criterion used was the 99 per cent level of reliability.

COMPARISON OF AGE GROUPS

Extent of Dental Need • In the total group studied, with increasing age there was noted an increase in the percentage of children needing dental care and in the percentage with one or more def teeth. As to the def rate, the number of teeth in need of treatment, and the percentage of children with six or more def teeth, there was a gradual increase from age two to age four, but not from age four to age five. These exceptions are accounted for by the PO patients showing a lower def rate and a smaller percentage of teeth requiring treatment at age five than at age four; and by both PO and Cl patients showing a lower percentage of children with six or more def

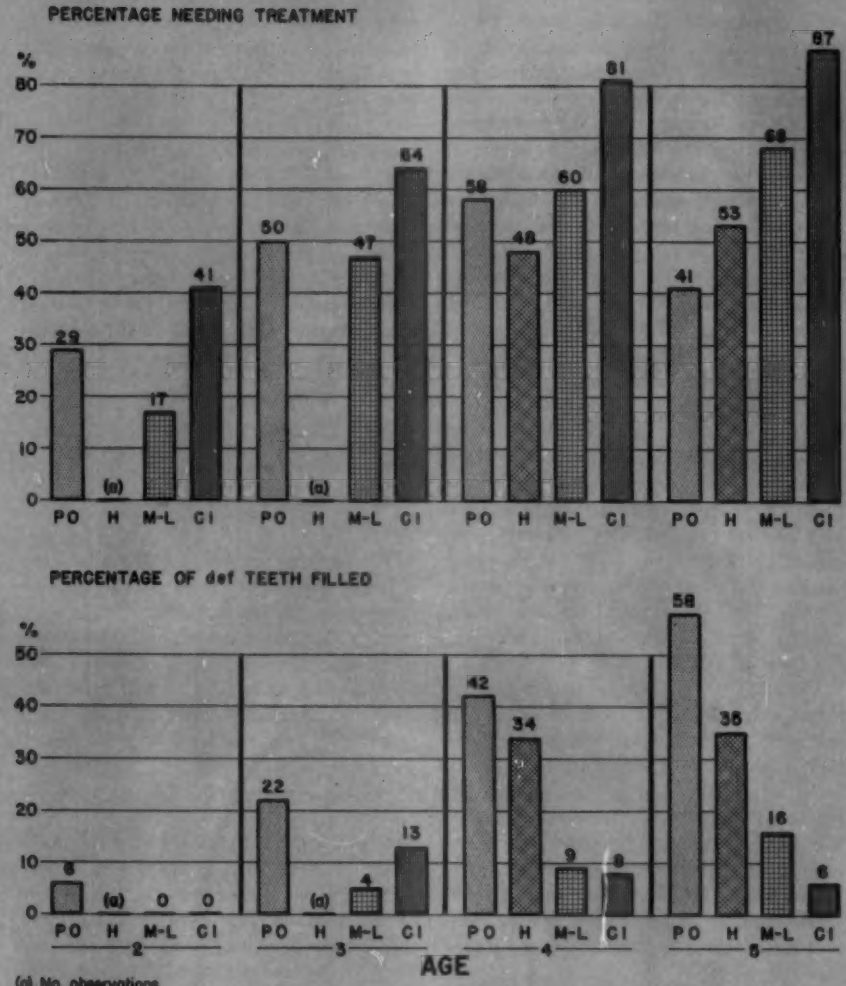

Fig. 2 • Percentage of Philadelphia preschool children needing treatment and percentage of def teeth filled, by age and income group

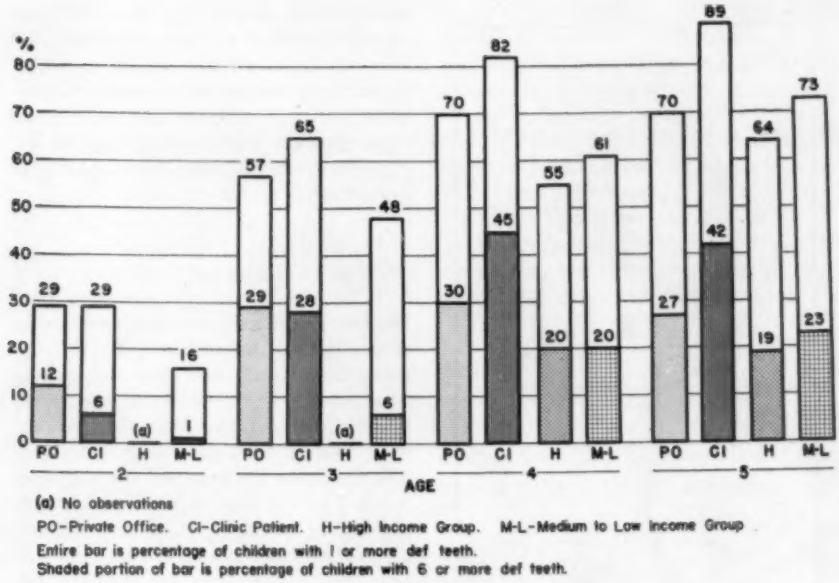

Fig. 3 • Percentage of Philadelphia preschool children with one or more and with six or more def teeth, by age and income group

teeth at age five than at age four.

Twenty per cent of the two-year-olds and 52 per cent of the three-year-olds were in need of treatment. This pronounced increase from two years to three years of age is also evident in the number of children having one or more def teeth (from 18 per cent at two years to 53 per cent at three years) and in the def rate (0.6 def teeth per child at age two, 2.2 def teeth per child at age three). By age five only 26 per cent of the children studied had experienced no dental decay.

Dental Needs Met • With increasing age there was noted an increase in the percentage of children with one or more filled teeth and also the percentage of decayed teeth filled (f/def). However, only 28 per cent of the five-year-olds had ever had a tooth filled.

COMPARISON OF INCOME GROUPS

Extent of Dental Need • A significantly higher percentage of the Cl group needed treatment than of the PO group at ages four and five. A significantly higher percentage of the Cl group had one or more def teeth at age five than the PO group. In this instance, comparison at age four showed no significant difference. The def rates were higher for the Cl group than for the PO group (Table 3).

In regard to the H and M-L groups, at age five the H group showed a lower percentage requiring treatment, a lower percentage with one or more def teeth, and a lower def rate than did the M-L group (Table 4).

Among the four-year-olds the H group of nonpatients showed 1.5 teeth per child requiring treatment (d-e-fd-fe teeth) whereas the M-L group showed 2.6 teeth

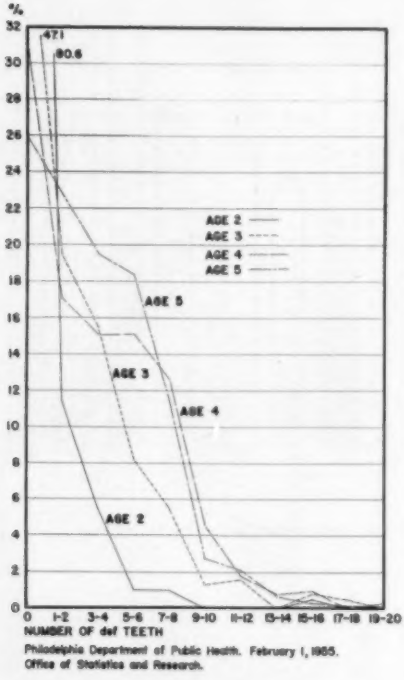

Fig. 4 • Frequency distribution of number of def teeth, by age group

per child requiring treatment. Among the five-year-olds the H group required treatment for 1.8 teeth per child and the M-L group for 2.8 teeth per child. Differences between the PO and Cl groups were even greater for both ages (Table 5).

Dental Needs Met • Among the four and five-year-olds and at all ages combined, the H group showed a significantly higher percentage of children with one or more filled teeth (total percentage based on children with one or more def teeth) and a significantly higher percentage of decayed teeth filled (f/def) than did the M-L group.

When the PO group and the Cl group were compared, the same differences were found: among the four and five-year-olds and at all ages combined, the PO (the high-income) group showed a significantly higher percentage of children with one or more filled teeth and a significantly higher percentage of decayed teeth filled than did the Cl (the low-income) group.

COMPARISON OF PATIENTS AND NONPATIENTS

Dental conditions were compared among those seeking treatment (PO and Cl groups combined) and those not seeking treatment (H and M-L groups combined). The evidence seems to indicate that children showing a higher susceptibility to caries are more apt to seek treatment. The def rate in the five-year-olds was higher among the combined PO and Cl patients than among the combined H and M-L nonpatients. In addition, the combined PO and Cl group showed a significantly higher percentage of children having one or more def teeth and also six or more def teeth, than did the combined H and M-L group (Table 6).

When comparing five-year-old Cl patients with five-year-old M-L nonpatients and when comparing PO patients with H nonpatients, it was observed that those seeking treatment showed higher def rates, a higher percentage having one or more def teeth, and a higher percentage having six or more def teeth than did nonpatients. The differences in percentages were statistically significant in the comparison of the Cl with the M-L group, but not significant when comparing the PO with H group (Table 7).

COMPARISON OF RACIAL GROUPS

No significant differences were found between white and nonwhite children except for the following: A significantly higher percentage of nonwhite children age five were in need of treatment than of white children age five. A significantly

smaller percentage of four and five-year-old nonwhite children had had one or more teeth filled. The four and five-year-old nonwhite children had had a significantly smaller percentage of def teeth filled than had white children at ages four and five (Table 8).

DISCUSSION

This dental survey, in which examining dentists used only mouth mirrors and explorers, is not presented to indicate actual dental needs of Philadelphia preschool children. Roentgen ray diagnosis undoubtedly would reveal more dental defects than shown by this examination.[7] Even with this qualification, however, the number of defects found was sufficiently significant to warrant more attention to dental problems of preschool children.

The study reinforced the opinion that examinations confined to clinic and private office patients do not reveal a true picture of dental conditions among the general population. Similarly, it may be hazardous, with the current dental habits of the American people, to estimate the

7. Chilton, N. W., and Greenwald, L. E. Studies in dental public health administration. II. Role of roentgenograms in public health surveys. J. D. Res. 26:129 April 1947.

Table 1 • Treatment needed by 2,677 preschool children, by age, income and treatment status

	Number examined	Children requiring treatment		Children with 1 or more def teeth		Teeth per child in need of treatment	
		No.	Per cent	No.	Per cent	No.	Av.
PO patients*							
Age 2	17	5	29.4	5	29.4	29	1.7
Age 3	42	21	50.0	24	57.1	128	3.0
Age 4	64	37	57.8	45	70.3	157	2.4
Age 5	73	30	41.1	51	69.9	125	1.7
Total	196	93	47.4	125	63.8	439	
Cl patients†							
Age 2	17	7	41.2	5	29.4	21	1.2
Age 3	89	57	64.0	58	65.2	266	3.0
Age 4	200	161	80.5	165	82.5	918	4.6
Age 5	368	321	87.2	327	88.9	1,745	4.7
Total	674	546	81.0	555	82.3	2,950	
H group‡							
Age 2	0§						
Age 3	0§						
Age 4	40	19	47.5	22	55.0	60	1.5
Age 5	436	233	53.4	278	63.8	775	1.8
Total	476	252	52.9	300	63.0	835	
M-L group ‖							
Age 2	167	28	16.8	28	16.8	59	0.4
Age 3	249	118	47.4	119	47.8	367	1.5
Age 4	332	199	59.9	204	61.4	850	2.6
Age 5	583	395	67.8	424	72.7	1,616	2.8
Total	1,331	740	55.6	774	58.2	2,892	
Total group							
Age 2	201	40	19.9	37	18.4	109	0.5
Age 3	380	196	51.6	201	52.9	761	2.0
Age 4	636	416	65.4	436	68.6	1,985	3.1
Age 5	1,460	979	67.1	1,080	74.0	4,261	2.9
Grand total	2,677	1,631	60.9	1,754	65.5	7,116	

*Private office patients.
†Clinic patients.
‡High-income nonpatients.
§No observations at ages two and three in high-income group.
‖Medium-to-low income nonpatients.

cost of proposed insurance treatment plans on the examination of nonpatients. Many of those with low caries experience rates may not seek treatment, whereas those with high experience rates will.

It is suggested, therefore, that more accurate and more relevant public health data be obtained by studying patients and nonpatients as separate segments of the population. Similarly, categories by income status should be established in dental surveys.

The advantage of early dental care and regular maintenance care (incremental dental care) can be pointed out in the following speculation, if it is assumed that the figures in the medium-to-low income group are representative of the group surveyed. There were 0.4 teeth in need of treatment at age two, 1.5 at age three, 2.6 at age four, and 2.8 at age five. If the carious teeth had been successfully treated each year, the averages would be 1.1 instead of 1.5 at age three, 1.1 instead of 2.6 at age four, and 0.2 instead of 2.8 at age five.

The small number of two and three-year-old children going to dental offices or clinics is indicative of limited interest in the dental needs of these children. However, the approximately 300 per cent increase in the number of carious teeth occurring during the third year emphasizes the urgency of beginning dental treatment before the third birthday. This would apply particularly to

Table 2 • Dental caries experience of 2,677 preschool children, by age, income and treatment status

	Number examined	Number of					Total def teeth	def per child	f/def
		d teeth	e teeth	f teeth	fd teeth	fe teeth			
PO patients									
Age 2	17	28	1	2	0	0	31	1.8	6.5
Age 3	42	124	2	35	2	0	163	3.9	22.7
Age 4	64	145	5	104	4	3	261	4.1	42.5
Age 5	73	101	12	145	12	0	270	3.7	58.1
Total	196	398	20	286	18	3	725		42.3
CI patients									
Age 2	17	21	0	0	0	0	21	1.2	0
Age 3	89	242	24	40	0	0	306	3.4	13.1
Age 4	200	815	90	69	12	1	987	4.9	8.3
Age 5	368	1,416	295	79	34	0	1,824	5.0	6.2
Total	674	2,494	409	188	46	1	3,138		7.5
H group									
Age 2	0*								
Age 3	0*								
Age 4	40	58	2	31	0	0	91	2.3	34.1
Age 5	436	732	41	417	2	0	1,192	2.7	35.2
Total	476	790	43	448	2	0	1,283		35.1
M-L income group									
Age 2	167	59	0	0	0	0	59	0.4	0
Age 3	249	361	3	11	3	0	378	1.5	3.7
Age 4	332	788	52	74	10	0	924	2.8	9.1
Age 5	583	1,459	132	270	22	3	1,886	3.2	15.6
Total	1,331	2,667	187	355	35	3	3,247		12.1
Total group									
Age 2	201	108	1	2	0	0	111	0.6	2.0
Age 3	380	727	29	86	5	0	847	2.2	10.7
Age 4	636	1,806	149	278	26	4	2,263	3.6	13.6
Age 5	1,460	3,708	480	911	70	3	5,172	3.5	19.0
Grand total	2,677	6,349	659	1,277	101	7	8,393		16.5

*No observations at ages two and three in high-income group.

Table 3 • Comparison of dental needs of four and five-year-old private office patients and clinic patients*

Age	Percentage children requiring treatment		Percentage with one or more def teeth		No. def teeth per child	
	PO	Cl	PO	Cl	PO	Cl
4	57.8	80.5	70.3	82.5	4.1	4.9
5	41.1	87.2	69.9	88.9	3.7	5.0

*The def rates have not in any instance been tested for significance. This applies also to the number of teeth requiring treatment.

Table 4 • Comparison of dental needs of four and five-year-old high-income nonpatients and medium-to-low income nonpatients

Age	Percentage children requiring treatment		Percentage with 1 or more def teeth		No. def teeth per child	
	H	M-L	H	M-L	H	M-L
4	47.5	59.9	55.0	61.4	2.3	2.8
5	53.4	67.8	63.8	72.7	2.7	3.2

Table 5 • Comparison of dental needs of four and five-year-old private office patients and clinic patients and high-income and medium-to-low income groups

Age	Number of teeth per child requiring treatment			
	PO group	Cl group	H group	M-L group
4	2.4	4.6	1.5	2.6
5	1.7	4.7	1.8	2.8

Table 6 • Comparison of dental needs of five-year-old children in the combined private office and clinic patient groups with five-year-old children in the combined high and medium-to-low income nonpatient groups

Group	No. def teeth per child	Percentage children with 1 or more def teeth	Percentage children with 6 or more def teeth
PO and Cl	4.7	85.7	39.2
H and M-L	3.0	68.9	21.0

sodium fluoride applications where children have not had the benefits of fluoridated water since birth.

The low percentage of decayed teeth filled in all income groups is an indication of the dental care needs of preschool children. The f/def rate for private office patients was only 42 per cent and for clinic patients 8 per cent. It is evident that even children in high-income families did not obtain adequate dental care: the f/def rate was 35 per cent for the H group.

The decrease in the def rate and the number of teeth in need of treatment in the private office patients five years of age as compared with those age four perplexed the authors, because most studies have indicated an increase at five years over the four year rate.[2] It is possible that the patient groups are more likely to have had some teeth removed. Such teeth would have been recorded as normal in the examination but may have been otherwise before extraction. (The def rate does not offer the opportunity to record "previously extracted primary teeth.")[8] This explanation might also account for the fact that the PO and Cl groups at age five showed fewer instances of six or more def teeth than PO and Cl groups age four. This question needs further investigation.

The observations in this survey supported the findings of Cohen[9] that deciduous teeth of children from higher socioeconomic groups showed less caries than did deciduous teeth of children from low-income families.

In this survey no figures on statistical significance for the def rates (average def) and the average number of teeth in need of treatment have been offered. Because of the abnormal nature of these distributions (Fig. 4), any measure of scatter is of little use; therefore the

8. Gruebbel, A. O. Measurement of dental caries prevalence and treatment service for deciduous teeth. J. D. Res. 23:163 June 1944.

9. Cohen, J. T. A statistical study of caries in the deciduous and permanent teeth of children. J.A.D.A. 23:312 Feb. 1936.

significance of the difference between means cannot be computed. It is even questionable whether any measure of central tendency should be applied to such a distribution. The DMF rate is, of course, a different matter.

This survey throws considerable light on the enormity of the problem of providing dental care for preschool-age children. The number of dentist-hours, the monetary expense involved in treating the defects revealed in this study, and the reported difficulty in treating young children would seem to indicate that there is little likelihood that present conditions could be improved considerably by operative dentistry alone.

Reducing the prevalence and incidence of dental caries by preventive measures is the objective that should be stressed. It has been established that optimal fluoridation of public water supplies will reduce the extent of dental caries in the deciduous teeth by 60 per cent and that topical application of fluoride will reduce new dental caries by 40 per cent. These preventive measures supplemented by early dental care, by healthful foods, by sugar reduction and by mouth hygiene should improve dental conditions considerably even with existing dental resources.[10-12]

SUMMARY

In order to obtain data to help Philadelphia community agencies to develop an effective citywide dental program for preschool children, a dental survey of 2,677 selected children was conducted. Children two to five years of age were examined in private dental offices, in kindergartens, housing projects, day nurseries, health department clinics, dental school clinics and hospital clinics. Comparisons of conditions that seem to be associated with age, economic and treatment status are reported.

The study seems to show that dental decay is widespread in preschool children, particularly at the lower income levels, and that decay begins early and increases rapidly. In addition, the amount of dental care received by children even in the higher income levels is inadequate.

The enormous backlog of dental defects in this age group reaffirms the necessity of optimal water fluoridation as a community preventive measure. Where water is not fluoridated and where the public water supply has only recently been fluoridated, as in Philadelphia, topical application of fluoride should be provided shortly after all the deciduous teeth have erupted. Certainly the data emphasize the importance of dental supervision and care before the third birthday.

Table 7 • Comparison of dental needs of five-year-old children in the clinic; medium-to-low income; private office and high-income groups

Group	No. def teeth per child	Percentage children with 1 or more def teeth	Percentage children with 6 or more def teeth
Cl	5.0	88.9	41.6
M-L	3.2	72.7	22.8
PO	3.7	69.9	27.4
H	2.7	63.8	18.6

Table 8 • Comparison of dental needs of four and five-year-old white and nonwhite children

Age	Percentage children in need of treatment		Percentage children with 1 or more filled teeth		f/def	
	W	NW	W	NW	W	NW
4	64.5	67.8	23.2	7.9	16.1	5.5
5	64.6	74.9	35.3	6.8	24.3	3.8

10. Pelton, W. J., and Wisan, J. M. Dentistry and public health, ed. 2. Philadelphia, W. B. Saunders Co., 1955, p. 93-129.

11. Muhler, J. C.; Hine, M. K., and Day, H. G. Preventive dentistry. St. Louis, C. V. Mosby Co., 1954, p. 16-21, 174-268.

12. Easlick, K. A. Ten "musts" in planning for dental health. J.A.D.A. 38:758 June 1949.

Effect of silicate cement and amalgam on the gingiva

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A great deal has been written about the effect of filling materials on the dental pulp. Massler,[1] in a paper published in 1955, cited 69 references in his bibliography, of which 51 were based on experimental work performed during the last decade. Many studies have demonstrated that silicate cements produce a severe reaction in the dental pulp, characterized by destruction of odontoblasts and the formation of abscesses. When placed in close proximity to the dental pulp, amalgam produces temporary changes in the odontoblasts and round cell infiltration in adjacent pulp tissue.[1-3] Although dentin is intimately connected with the dental pulp, it does act to some extent as a protective layer for this tissue.

In contrast to the wealth of investigations on pulp reactions to filling materials, very little can be found on the reaction of gingival tissues to filling materials beyond the statement that overhanging margins of fillings produce gingival disease.[4] Since all the varieties of filling materials often are placed beneath the gingival margin and thus contact the gingival tissues, the question arises whether these materials may elicit a reaction in the gingiva.

Waerhaug and Zander[5] have studied the reaction of gingival tissues to self-curing acrylic restorations and have concluded that such restorations produce a chronic inflammatory reaction in the adjacent gingival cuff. This reaction was produced by the existence of a crevice filled with plaque material between the resin restoration and the tooth cavity as well as by plaque material which was found on the surface of the resin filling and in contact with the pocket epithelium. The presence of a poor marginal seal with self-curing acrylic restorations has been well documented.[6] From the study by Waerhaug and Zander[5] it may be deduced that this poor marginal seal of self-curing acrylic restorations also may contribute to the reaction of the gingival tissues. A comparison of the gingival reaction of self-curing acrylic materials with that of silicate cements and amalgam was made in the study described herein.

This investigation was supported by a research grant from the Division of Research Grants and Fellowships of the National Institutes of Health, United States Public Health Service.

Chairman, division of periodontology, School of Dentistry, University of Minnesota.

1. Massler, M. Effects of filling materials on the pulp. J. Tennessee D.A. 35:353 Oct. 1955.

2. Manley, E. B. Preliminary investigation into reaction of pulp to various filling materials. Brit. D.J. 60:321 April 1, 1936.

3. Manley, E. B. Investigations into early effects of various filling materials on the human pulp. D. Record 62:1 Jan. 1942.

4. Report of evaluating committee II (Periodontal workshop). Local factors in periodontal disease. J.A.D.A. 45:16 July 1952.

5. Waerhaug, J., and Zander, H. A. Reaction of gingival tissues to self-curing acrylic restorations. J.A.D.A. 54:760 June 1957.

6. Seltzer, S. Penetration of microorganisms between tooth and direct resin fillings. J.A.D.A. 51:560 Nov. 1955.

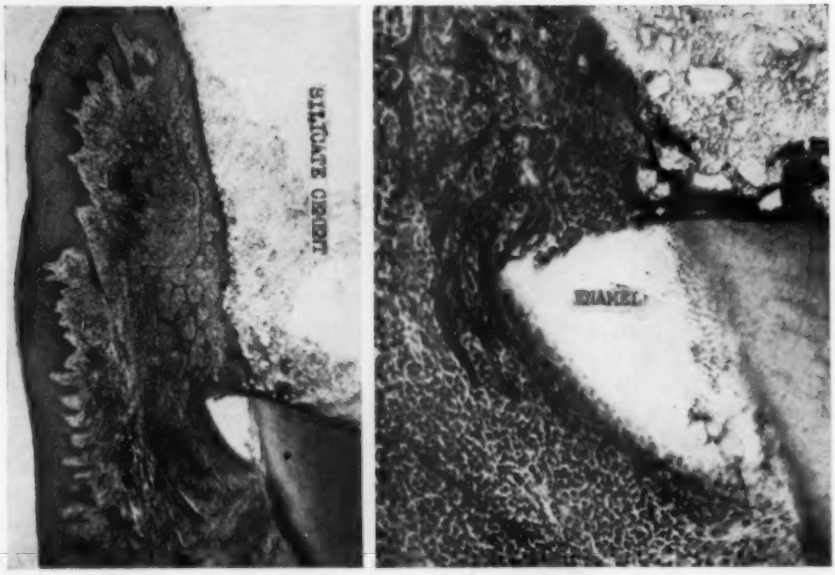

Fig. 1 • LL-2. Silicate restoration in place 14 weeks. Left: The silicate cement was under-contoured 0.2 mm. on its gingival margin. Severe inflammatory reaction in the gingival tissues adjacent to silicate cement. Right: Higher magnification of crevice between silicate cement and dentin floor, 0.04 mm., filled with plaque material

MATERIAL AND METHOD

Twenty cavities were prepared in the gingival third of the buccal surfaces of monkeys' teeth and extended up to 3 mm. beneath the crest of the gingival tissues. Eight cavities were filled with amalgam, 8 with silicate and 4 with self-curing acrylic resin. Amalgam fillings were contoured with pluggers and metal carvers. Amalgam debris was flushed out of the sulcus. Silicate cement was contained in the cavity with a matrix and subsequently coated with cocoa butter.

The brush-on technic was used to develop the acrylic restorations, and an excess contour was produced which was corrected later by polishing. One half of the restorations were highly polished one week after insertion, whereas the other half were just finished down with fine garnet disks and left unpolished. The clinical judgment of the restorations placed was that they ranged from good to excellent.

The restorations remained in place for three months. Four teeth without treatment were studied histologically. Specimens were obtained of the teeth together with surrounding periodontal tissues. These specimens were fixed in Zenker-Formol solution, decalcified in 5 per cent nitric acid, embedded in celloidin, and 12 micra thick sections were stained with hematoxylin and eosin for microscopic study.

RESULTS

Although the clinical examination of the restorations and the adjacent gingival tissues revealed no specific pathologic changes, histologic examination of the sections showed that most restorations

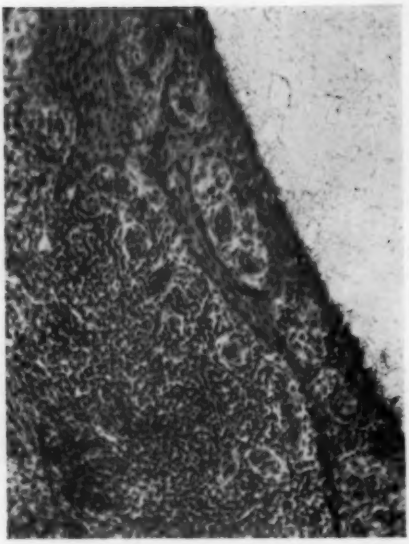

Fig. 2 • Higher magnification of gingival tissues shown in Figure 1, left, in contact with silicate cement. Note inflammatory cells between epithelium and silicate cement, many new capillaries, dense diffuse cellular infiltration

had a slight overhang or shortage on the gingival margin that amounted to about 0.2 mm.

The effect of silicate cement on the adjacent gingival tissues was characterized by a severe inflammatory reaction (Fig. 1, 2). The epithelium in contact with the silicate cement was very thin, with many leukocytes and lymphocytes present in the epithelium. The same type of cells had migrated through the epithelium and were in contact with the silicate cement (Fig. 2). The connective tissue, or submucous layer, was characterized by the presence of an unusually large number of capillaries close to the epithelium. A heavy diffuse accumulation of leukocytes, lymphocytes, and plasma cells was present (Fig. 2). Epithelium strands extended deep into this region of cellular infiltration (Fig. 1). A common finding was a crevice at the margin between the silicate cement and the wall of the cavity (Fig. 1, right). Usually this was filled with plaque material and round cells (Fig. 1, right).

The reaction of the gingival tissues to amalgam was very similar to their reaction to silicate cements (Fig. 3). In this instance the gingival margin of the amalgam restoration extended 2.3 mm. below the gingival crest. Figure 3, right, is a higher magnification from the tissue adjacent to the amalgam. The epithelial cells in contact with the amalgam appear altered from normal; there are long extensions of strands of epithelium into the connective tissue. The connective tissue is full of diffusely arranged lymphocytes and plasma cells with occasional leukocytes present.

The reaction of the gingival tissues to these two filling materials is similar to that seen to calculus (Fig. 4). This illustration was obtained of one of the four teeth that were not treated.

DISCUSSION

Clinical observations[7, 8] of a chronic inflammatory reaction of the gingival tissues around restorations are confirmed by the present investigation. There is no doubt that not only dental calculus but also the materials used in restorative dentistry may be a contributing factor in gingival disease. The degree of tissue response to such irritation undoubtedly varies with each individual. It may result in "gingival recession" in the individual with a good oral hygiene regime and good tissue response. It may lead to pocket formation with loss of supporting structures in the individual with poor oral hygiene care or "poor tissue resistance" and "poor bone factor."

A comparison of the gingival irritation

7. Miller, S. C. Textbook of periodontia, ed. 3. Philadelphia, Blakiston Co., 1950, p. 83.

8. Goldman, H. M. Periodontia, ed. 2. St. Louis, C. V. Mosby Co., 1949, p. 337.

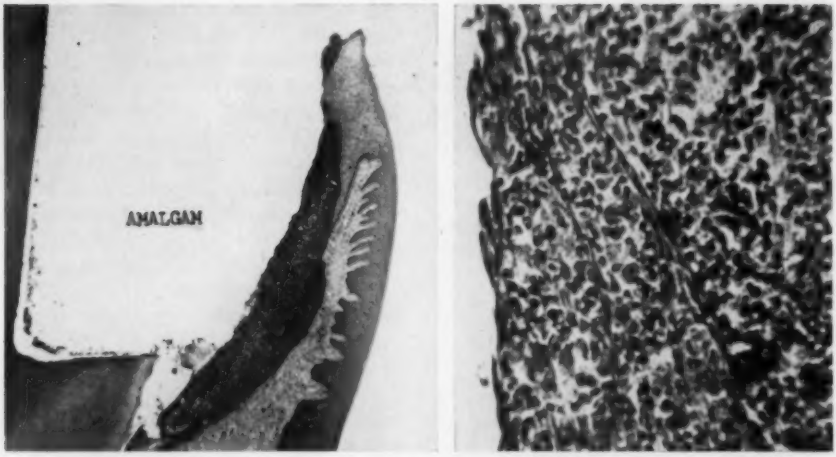

Fig. 3 • UR-5. Polished amalgam restoration in place 14 weeks. Dense diffuse cellular infiltration in gingival tissue adjacent to restoration. Right: Higher magnification of gingival tissue adjacent to amalgam

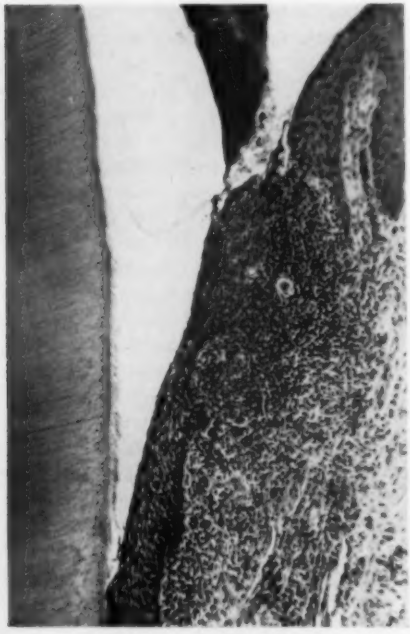

Fig. 4 • LR-6. Untreated tooth of same monkey as shown in other figures. Reaction of gingival tissues to calculus

from silicate cement, amalgam, and acrylic restorations shows that all of these materials produce a chronic inflammation. It is difficult to decide whether differences exist in the degree of inflammation produced by these materials, with the possible exception of a somewhat lesser degree of response to the acrylic resin. An overhang or underhang of 0.2 mm. is not detectable with the clinical instruments used in dental practice, and the mere act of polishing or finishing a restoration will create such a discrepancy. No differences were apparent between the gingival reaction to the polished restorations and the reaction to finishing with garnet disks only.

It is important for the dental practitioner to understand the shortcomings of restorative dentistry and the biological properties of the materials used in restorative dentistry, both in regard to their effect on the dental pulp and on the gingival tissues. Ordinarily, the type of tissue reaction found in this investigation may be tolerated for a long time without the appearance of definite clinical symptoms. In patients in whom such clinical

symptoms as chronic gingivitis, recurrent necrotizing ulcerative gingivitis and periodontal pockets do appear, such conditions can sometimes be treated successfully only by removal of gingival tissues below the margin of dental restorations. The institution of a good oral hygiene regime will keep the gingival margins clean for the patients and prevent the recurrence of secondary caries.

Effect of sodium lauroyl sarcosinate and dehydroacetic acid on sulcal and smooth surface caries (buccal-lingual) in the white rat

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A number of diverse chemical agents have been studied previously for their inhibitory effect on dental caries.[1] The evidence is extensive that fluorides inhibit caries in the rat[2-6] as well as in the human being.[7-13] In addition, iodoacetic acid[2, 3] and the antibiotics, penicillin,[14, 15] bacitracin, chloramphenicol, chlortetracycline and streptomycin[15] are effective in varying degrees as inhibitors of rat caries. The cariostatic efficacy of penicillin in the human being appears to be equivocal.[16, 17]

In 1953, sodium dehydroacetate and sodium lauroyl sarcosinate were proposed as caries inhibiting agents in the human,[18] and a clinical report has appeared on the efficacy of the latter compound when incorporated in a dentifrice.[19]

It was the primary purpose of the current studies to test the efficacy of sodium lauroyl sarcosinate (SLS) and dehydroacetic acid (DHA) on both sulcal and smooth surface caries by adding these substances to the diet of the white rat. The relation of the well-known detergent property of sodium lauroyl sarcosinate[20] to its possible cariostatic effect was evaluated by studying the caries inhibiting effect of another widely used detergent, sodium lauryl sulfate ($SLSO_4$).[21]

PLAN OF EXPERIMENT

The general organization and results of the studies made by the authors are

*National Institute of Dental Research, National Institutes of Health.

1. Hein, J. W. Effect of various agents on experimental caries. In Advances in experimental caries research, Sognnaes, R. F., editor. Washington, D. C. American Association for the Advancement of Science, 1955.

2. Miller, B. F. Inhibition of experimental dental caries in the rat by fluoride and iodoacetic acid. Proc. Soc. Exper. Biol. & Med. 39:389 Nov. 1938.

3. McClure, F. J., and Arnold, F. A. Observations on induced dental caries in rats. I. Reduction by fluorides and iodoacetic acid. J.D. Res. 20:97 April 1941.

4. Zipkin, I., and McClure, F. J. Complex fluorides. Caries reduction and fluoride retention in the bones and teeth of white rats. Pub. Health Rep. 66:1523 Nov. 23, 1951.

5. Zipkin, I., and McClure, F. J. Cariostatic effect and metabolism of ammonium fluosilicate. Pub. Health Rep. 69:730 Aug. 1954.

6. Muhler, J. C.; Nebergall, W. H., and Day, H. G. Studies on stannous fluoride and other fluorides in relation to solubility of enamel in acid and the prevention of experimental dental caries. J.D. Res. 33:33 Feb. 1954.

7. Knutson, J. W., and Armstrong, W. D. Effect of topically applied sodium fluoride on dental caries experience. Pub. Health Rep. 58:1701 Nov. 19, 1943.

Table 1 • Effect of sodium lauroyl sarcosinate, dehydroacetic acid, and sodium lauryl sulfate on sulcal caries. Diet 585

Experiment		A		B		C		
Diet supplement		—	0.5% SLS	—	0.1% DHA	—	0.5% SLS	0.5% SLSO[4]
No. of rats*		30	30	15	15	30	30	28
Days on experiment		100	100	102	102	99	99	99
Mean daily diet intake	(Gm.)	10.1	9.7	10.7	9.6	9.8	9.8	9.7
	S.E.	± 0.2	± 0.2	± 0.3	± 0.2	± 0.2	± 0.2	± 0.2
Mean daily gain	(Gm.)	1.6	1.6	1.6	1.3	1.7	1.7	1.7
	S.E.	± 0.03	± 0.03	± 0.04	± 0.04	± 0.05	± 0.05	± 0.03
Rats with caries	(%)	93.3	89.3	100.0	93.3	100.0	86.7	92.9
Carious teeth per rat	(No.)	3.6	2.8	3.5	3.6	3.6	2.4	3.1
	S.E.	± 0.3	± 0.3	± 0.2	± 0.4	± 0.2	± 0.3	± 0.2
Carious areas per rat	(No.)	8.2	4.1	7.2	6.7	7.6	3.6	7.1
	S.E.	± 0.7	± 0.5	± 1.0	± 1.0	± 0.6	± 0.5	± 0.9
Severity score per rat		20.4	9.4	16.7	14.9	18.0	6.9	16.1
	S.E.	± 2.0	± 1.5	± 2.6	± 2.6	± 1.8	± 1.2	± 2.3

*Sprague-Dawley.

shown in Tables 1 and 2. The effect of control and test diets was compared on littermate female rats which were started on their dietary regimens at weanling age. In Experiments A-E, food and water were available *ad libitum*. An estimate of diet intake was obtained. Diet was offered three times weekly and recorded. Some spillage was observed in all instances and appeared to be equally distributed in all groups.

In Experiment F, the rats were pair fed. Caries of the occlusal sulci was diagnosed according to Cox and co-workers[22] at the end of 100 days, and that of the buccal and lingual surfaces was evaluated according to McClure and Folk[23] at the end of 60 days.

Diet 585, which induces caries in occlusal sulci (Experiments A, B[24] and C), contained whole milk powder, 30 per cent; yellow corn grits, 42 per cent; cane sugar, 25 per cent; liver powder, 2 per cent; and a salt mix, 1 per cent.[26] The cariostatic efficacy of SLS[27] and $SLSO_4$[27, 28] was observed at the 0.5 per cent level in the diet with relation to the proportions of lauroyl and lauryl groups respectively. The surface tension activities of 0.5 per cent, 1.0 per cent and 2.0 per cent aqueous solutions of SLS and $SLSO_4$ were determined using the Du Noüy Interfacial Tensiometer.

Diet 636, which induced caries of the smooth surfaces involving chiefly the buccal and lingual regions (Experiments D,

8. Hutton, W. L.; Linscott, B. W., and Williams, D. The Brantford fluorine experiment. Interim report after five years of water fluoridation. Canad. J. Pub. Health 42:81 March 1951.

9. Ast, D. B., and Chase, H. C. The Newburgh-Kingston caries fluorine study. IV. Dental findings after six years of water fluoridation. Oral Surg., Oral Med. & Oral Path. 6:114 Jan. 1953.

10. Arnold, F. A., Jr.; Dean, H. T., and Knutson, J. W. Effect of fluoridated public water supplies on dental caries prevalence. Pub. Health Rep. 68:141 Feb. 1953.

11. Hill, I. N.; Blayney, J. R., and Wolf, W. Caries exposure rates of 12-, 13- and 14-year-old school children after exposure to artificially fluoridated water for 59 to 70 months. (Abst.) J.D. Res. 32:654 Oct. 1953.

12. Howell, C. L., and others. Effect of topically applied stannous fluoride on dental caries experience in children. J.A.D.A. 50:14 Jan. 1955.

13. Muhler, J. C., and others. Effect of a stannous fluoride-containing dentifrice on caries reduction in children. II. Caries experience after one year. J.A.D.A. 50:163 Feb. 1955.

14. McClure, F. J., and Hewitt, W. L. Relation of penicillin to induced rat dental caries and oral L. acidophilus. J.D. Res. 25:441 Dec. 1946.

15. Stephan, R. M., and others. Comparative effects of penicillin, bacitracin, chloromycetin, aureomycin, and streptomycin in experimental dental caries and on certain oral bacteria in the rat. J.D. Res. 31:421 June 1952.

16. Zander, H. A. Effect of a penicillin dentifrice on caries incidence in school children. J.A.D.A. 40:569 May 1950.

17. Hill, T. J.; Sims, J., and Newman, M. Effect of penicillin dentifrice on control of dental caries. J.D. Res. 32:448 Aug. 1953.

18. Fosdick, L. S., and others. A new approach to the problem of dental caries control. J.D. Res. 32:486 Aug. 1953.

19. Fosdick, L. S. Preliminary clinical report on effectiveness of sodium-N-lauroyl sarcosinate in control of dental caries. Northwestern Univ. Bul. 54:20 Dec. 1953.

20. British Patent Specification 459,039 (Dec. 28, 1936). Manufacture of washing agents and detergents.

Table 2 • Effect of sodium lauroyl sarcosinate and dehydroacetic acid on smooth surface caries. Diet 636

Experiment		D			E			F	
Diet supplement		—	0.5% SLS	0.1% DHA	—	0.5% SLS	0.1% DHA	—	0.1% DHA
No. of rats*		36	34	28	36	39	35	37	31
Days on experiment		60	60	60	60	60	60	63	63
Mean daily diet intake	(Gm.)	9.9	9.5	7.8	13.1	13.1	9.5	—	—
	S.E.	± 0.2	± 0.2	± 0.3	± 0.4	± 0.3	± 0.3	—	—
Mean daily gain	(Gm.)	1.2	1.2	0.8	1.8	1.8	1.2	0.0	0.8
	S.E.	± 0.05	± 0.05	± 0.04	± 0.04	± 0.04	± 0.05	± 0.05	± 0.05
Rats with caries	(%)	69.4	29.4	100.0	84.4	64.1	100.0	89.2	100.0
Carious teeth per rat	(No.)	1.5	0.6	7.1	3.5	1.5	5.0	3.5	6.7
	S.E.	± 0.2	± 0.5	± 0.4	± 0.4	± 0.3	± 0.5	± 0.5	± 0.4
Carious areas per rat	(No.)	2.1	0.9	16.5	6.1	2.2	10.5	6.3	16.2
	S.E.	± 0.4	± 0.3	± 1.5	± 1.1	± 0.5	± 1.6	± 1.3	± 2.4
Severity score per rat		2.3	1.0	30.5	7.5	2.2	15.9	8.4	28.2
	S.E.	± 0.4	± 0.3	± 2.4	± 1.5	± 0.5	± 2.2	± 1.9	± 4.5

*Experiments D and E—Osborne-Mendel. Experiment F—Sprague-Dawley.

E and F, Table 3), contained "dry autoclaved" skim milk powder, 35.0 per cent; cornstarch, 45.0 per cent; cerelose (glucose) 18.0 per cent; and liver powder, 2 per cent.[28] Experiment D was planned to ascertain the effects of SLS and DHA on smooth surface caries (Diet 636). Experiment E repeated Experiment D,[29] with a different brand of skim milk powder.[30] Experiment F was a repeat study of the effect of DHA using a different strain of rats. Mean data expressing the magnitude of the carious process are reported with standard errors in Tables 1 and 2. These data are based on all the surviving rats without regard to littermate pairing.

The means of pairs of rats were treated statistically by Fisher's t test for paired values. The p values are recorded in Table 3. The figures for percentage differences are also based on mean data for paired rats. The difference in the percentage of rats with caries between the control and test groups was compared on a paired basis according to the chi square test.[31]

Fifty grams of control and experimental diets were triturated with 50 ml. of water and the pH was taken; the Beckman Model G Meter was used.

Some additional observations were made regarding the acute toxic effects of DHA on diet intake and weight gain. Sixteen litters of female Sprague-Dawley rats (three per litter) were divided into

21. Thomssen, E. G., and McCutcheon, J. W. Soaps and detergents. New York, McNair-Dorland Co., 1949, p. 402.

22. Cox, G. J., and others. Experimental dental caries. III. A system of recording corn meal caries in rats. J.D. Res. 18:469 Dec. 1939.

23. McClure, F. J., and Folk, J. E. Skim milk powders and experimental rat caries. Proc. Soc. Exper. Biol. & Med. 83:21 May 1953.

24. In Experiment A (Table 1) a test group of rats not shown in the table received 0.5 per cent DHA (Practical Grade, Eastman Kodak Co., Rochester, N. Y.) but all died by the end of three weeks. In Experiment B, to obviate the possibility that an impurity was responsible for its toxicity, DHA was recrystallized from 95 per cent ethyl alcohol (m.p. 109.5-111.0°C.; literature 109-111°C.[25]) and fed to three groups at 0.1 per cent, 0.3 per cent and 0.5 per cent levels respectively. Those which received 0.3 per cent and 0.5 per cent recrystallized DHA also died within three weeks and are not included in Table 1.

25. Wolf, P. A., and Westveer, W. M. The antimicrobial activity of several substituted pyrones. Arch. Biochem. 28:201 Sept. 1950.

26. Harris, M. R., and Stephan, R. M. Comparative effects of two basic diets with and without EDTA on experimental caries in rats. (Abst.) J.D. Res. 33:707 Oct. 1954.

27. Kindly supplied by Geigy Industrial Chemicals, New York. Recrystallized from abs. EtOH. Calculated for SLS $C_{15}H_{28}O_3NNa$: C, 61.41; H, 9.62; N, 4.78. Found: C, 60.43; H, 10.38; N, 4.49. Compound judged to be about 96 per cent pure.
M.W. = 279; $\frac{\text{Lauroyl group}}{279} = 0.65$

28. Calculated for SLSO$_4$ $C_{15}H_{28}O_4SNa$: C, 49.97; H, 8.74. Found: C, 49.14; H, 8.51.
M.W. = 288; $\frac{\text{Lauryl group}}{288} = 0.64$

29. The roller process, nonfat, dry milk solids used in Experiment D were obtained from Land O' Lakes Creameries, Inc., Minneapolis.

30. M-T brand, roller process, nonfat, dry milk solids. H. Muller-Thym Distributor, Haverford, Pa.

three equal groups and housed individually. Group I received Diet 585, Group II received Diet 585 containing 0.6 per cent sodium dehydroacetate[32] (DHA-S, equivalent to 0.5 per cent DHA). At the end of eight days, the diet intakes and weight gains of the surviving rats were recorded.

RESULTS

Studies on Sulcal Caries (Diet 585) • The results of Experiments A, B and C are shown in Table 1.

Experiment A • In Experiment A, the addition of SLS to Diet 585 reduced significantly the number of carious teeth (22.2 per cent), the carious regions (48.1 per cent) and the severity score per rat (51.8 per cent). No effect of SLS on diet intake or weight gain was noted.

Experiment B • In Experiment B, 0.1 per cent DHA had no significant effect on sulcal lesions as induced by Diet 585 (Table 3). There was a significant reduction in weight gain (Table 1) and diet intake.

Experiment C • In Experiment C, SLS again caused a significant reduction in number of carious teeth (33.3 per cent), carious regions (52.6 per cent) and severity score (61.7 per cent). The detergent $SLSO_4$ had no cariostatic effect. Apparently, SLS and $SLSO_4$ had no effect on food intake and weight gain.

No differences in the percentage of rats with caries were observed in Experiments A, B or C.

In connection with SLS and $SLSO_4$, the possibility existed that a wide difference in surface tension activity between these two compounds might explain the divergent anticaries effects. The surface tension activity of $SLSO_4$, as shown in the tabulation, is significantly greater than that of SLS at equal concentration, and thus it appears that the cariostatic effect of SLS cannot be due to surface tension activity.

H_2O		72.2 ± 0.11	
Concentration	0.5%	1.0%	2.0%
SLS	39.7 ± 0.28	39.9 ± 0.18	42.1 ± 0.04
$SLSO_4$	31.2 ± 0.08	31.7 ± 0.12	32.2 ± 0.20

Values are in arbitrary units and represent means of five trials. Standard errors are calculated according to Mantel.[33]

Studies on Smooth Surface Caries (Diet 636) • Although some evidence of sulcal caries has been observed on Diet 636,[23] only caries of the buccal and lingual surfaces was scored in rats receiving this diet.

The results of Experiments D, E and F are shown in Table 2.

Experiment D • In Experiment D, the addition of 0.5 per cent SLS to Diet 636 reduced the incidence of rats with caries (57.8 per cent), the number of carious teeth (65.6 per cent), the number of carious regions (59.1 per cent), and the severity score per rat (59.1 per cent). In all instances, p was less than 0.01 for the paired comparisons (Table 3). There was no effect on either the daily diet intake or weight gain. The addition of 0.1 per cent DHA to Diet 636 produced a decided increase in the caries experience. The incidence of rats with caries was increased 44.1 per cent, whereas the num-

31. $X^2_c = \frac{[(b\text{-}c) - 1]^2}{b + c}$ Where X^2_c = chi square corrected for continuity, b = no. of cases where rat is carious in first group, but paired mate in second group is not carious, c = no. of cases where rat is carious in second group, but paired mate in first group is not carious, and (b-c) = absolute difference between b and c.

32. Obtained from Gane's Chemical Works, Inc., New York. Calculated for $C_8H_7O_4Na.H_2O$: C, 46.16; H, 4.36. Found C, 46.20; H, 4.44. At the time the caries studies were initiated, a source of DHA-S was not known. The afore-mentioned source was ascertained in time for the acute toxicity study.

33. Mantel, N. Rapid estimation of standard errors of means for small samples. Amer. Stat. 5:26 Oct. 1951.

ber of carious teeth, the number of carious regions and the severity score per rat were increased approximately 400 per cent, 700 per cent and 1200 per cent respectively. The addition of 0.1 per cent DHA to Diet 636 also reduced the diet intake and the weight gain.

Experiment E • No effect of SLS on either diet intake or growth was observed in Experiment E. As in Experiment D, SLS again decreased both the incidence and severity of the smooth surface lesions induced by Diet 636. There was a reduction in incidence of rats with caries (31.9 per cent), in the number of carious teeth (57.1 per cent), in the number of carious regions (64.5 per cent), and in the severity score per rat (71.1 per cent). Again the reductions in caries experience were significant at the 1 per cent level of probability for paired comparisons (Table 3). In this repeat study on the effect of the addition of 0.1 per cent DHA to Diet 636, there was no significant change in the number of rats with caries, but the increase in carious teeth, carious regions and severity score per rat was 55.9 per cent, 74.6 per cent, and 128.4 per cent respectively. These increases were highly significant as shown in Table 3. DHA again reduced both the diet intake and weight gain.

Experiment F • In Experiment F, Diet 636 contained the same skim milk powder preparation as was used in Experiment E; however, another strain of rats (Sprague-Dawley) was used. Incidence of caries in rats fed Diet 636 was not increased by the addition of DHA, but again there was a pronounced increase in the number of carious teeth (67.5 per cent), the number of carious regions (120 per cent) and the severity score per rat (180 per cent).

The pH of the diets used in these experiments was as follows: Diet 585, pH, 6.0; 585 + 0.5 per cent DHA, 6.0; 636, 6.0; 636 + 0.1 per cent DHA, 5.9.

Acute DHA Toxicity Study • The mean daily diet intake and weight gain of rats receiving Diet 585 containing an added 0.5 per cent DHA or 0.6 per cent DHA-S for eight days are shown in Table 4.

There was a considerable reduction in the estimated daily diet intake as well as a pronounced loss in weight in rats receiving either DHA or DHA-S. Since the mean daily diet intake was approximately 2.5 Gm. and the final body weight was about 25 Gm., the toxic level on this basis was $\frac{2.5 \times 0.005 \times 1{,}000}{25}$ or 0.5 Gm. per kilogram of body weight.

Table 3 • Evaluation of differences in caries data according to Fisher's t test for paired comparisons

Diets and supplements	p values				
	Experiment	% Carious rats	Carious teeth	Carious regions	Severity score
585 vs. 585+0.5% SLS	A	>0.05	<0.02	<0.01	<0.01
585 vs. 585+0.1% DHA	B	>0.05	>0.05	>0.05	>0.05
585 vs. 585+0.05% SLS	C	>0.05	<0.01	<0.01	<0.01
585 vs. 585+0.5 % $SLSO_4$		>0.05	>0.05	<0.01	>0.05
636 vs. 636+0.5% SLS	D	<0.01	<0.01	<0.01	<0.01
636 vs. 636+0.1% DHA		<0.05*	<0.01*	<0.01*	<0.01*
636 vs. 636+0.5% SLS	E	<0.01	<0.01	<0.01	<0.01
636 vs. 636+0.1% DHA		>0.05	<0.01*	<0.02*	<0.01*
636 vs. 636+0.1% DHA	F	>0.05	<0.01*	<0.02*	<0.01*

*Increase of test over control. All other values pertain to significance of decrease in test over control.

Table 4 • Daily diet intake and weight gain of rats receiving Diet 585 containing an added 0.5 per cent DHA or 0.6 per cent DHA-S

Diet	585	585+0.5% DHA	585+0.6% DHA-S
Days on experiment	8	8	8
Rats (Sprague-Dawley)	16	8	8
Mean daily diet intake	7.4±0.1	2.4±0.4	2.4±0.06
Final weight	49.8±2.1	27.8±2.9	24.5±3.6
Initial weight	29.6±1.4	35.0±2.6	32.8±2.2
Mean daily weight change	+ 2.5±0.1	− 0.9±0.1	− 1.0±0.1

DISCUSSION

Under the conditions of these experiments, sodium lauroyl sarcosinate significantly inhibited caries in the occlusal sulci (Diet 585) and on the buccal and lingual surfaces (Diet 636) of rats. The ability of this compound to inhibit sulcal caries induced by Diet 585 appears to be unrelated to its detergent properties, since sodium lauryl sulfate, which is significantly more surface-active, does not inhibit this type of caries. SLS has been studied for its "antienzyme" activity.[19, 34, 35] It has been shown that acid formation is considerably reduced when normal human saliva is incubated with glucose in the presence of small amounts of SLS.[34] It has also been demonstrated recently that phosphate uptake and glucose disappearance in intact yeast cells are strongly inhibited by SLS, and that this reduction of glycolytic activity may be due, at least in part, to inhibition of hexokinase,[35] an enzyme present in whole, human saliva.[36]

The ability of both SLS and DHA-S to inhibit acid formation on the dental plaque after a sugar rinse was reported by one group of investigators[19] who proposed this action as evidence of cariostatic activity of these compounds. Other investigations have not confirmed this acid inhibitory effect of SLS[37, 38] or DHA.[38] It appears, therefore, that the explanation of the mechanism of action of SLS in inhibiting caries in the rat and the human remains obscure.

In the present studies, DHA was used in place of its sodium salt.[32] The pH of the cariogenic diets was not significantly affected by the addition of DHA. Since the sodium salt hydrolyzes readily, it may be expected to show an activity similar to that demonstrated by the free acid. In addition it was observed that the sodium salt and the free acid produced a similar inhibition of diet intake and weight gain. Seevers and co-workers[39] and Shideman, Woods and Seevers[40] have shown that DHA is a potent succinic dehydrogenase inhibitor. They propose that the toxicity of DHA is largely due to interference with oxidative mechanisms leading to a disturbance of the acid-base balance.

The potentiating effect of DHA on caries has proved particularly interesting and is the first evidence we have obtained which identifies a specific chemical with an increase in smooth surface caries induced by Diet 636. DHA did not appear to affect sulcal caries induced by Diet

34. Carbon, J. A.; Blackwell, R. Q., and Fosdick, L. S. The site of action of sodium-N-lauroyl sarcosinate on the glycolytic scheme. (Abst.) J.D. Res. 33:652 Oct. 1954.

35. Carbon, J. A., and others. Inhibition of anaerobic glycolysis by sodium-N-lauroyl sarcosinate. Arch. Biochem. & Biophys. 55:356 April 1955.

36. Jones, R. T., Jr., and Lisanti, V. F. Hexokinase activity in human saliva. (Abst.) J.D. Res. 33:664 Oct. 1954.

37. Forscher, B. K., and Hess, W. C. Validity of plaque pH measurements as a method of evaluating therapeutic agents. J.A.D.A. 48:134 Feb. 1954.

38. Brudevold, F.; Little, M. F., and Rowley, J. Acid-reducing effect of "anti-enzymes" in the mouth. J.A.D.A. 50:18 Jan. 1955.

39. Seevers, M. H., and others. Dehydroacetic acid (DHA). II. General pharmacology and mechanism of action. J. Pharmacol. Exp. Therap. 99:69 May 1950.

40. Shideman, F. E.; Woods, L. A., and Seevers, M. H. Dehydroacetic acid (DHA). IV. Detoxification and effects on renal function. J. Pharmacol. Exp. Therap. 99:98 May 1950.

585, but in repeated trials caused a remarkable increase in the severity of smooth surface caries as induced by Diet 636. These observations suggest a difference in the etiology of the two types of caries as produced by these cariogenic diets. A previous study comparing smooth surface caries and sulcal caries produced by Diet 636 has also suggested differences in their etiology.[41] Since much effort is being expended to explain the cause of cariogenicity in Diet 636, this result will be investigated further to help resolve this important question. The toxicity of DHA suggests future studies on the physiological effects of this substance, particularly in relation to its caries potentiating action.

In the present study, SLS inhibited both sulcal and smooth surface caries in the rat when incorporated in the diet. These results agree with the preliminary clinical report that SLS inhibits human caries when incorporated in a dentifrice.[19] Volker, Apperson and King,[42] on the other hand, found that SLS "gave only a small effect against hamster caries" under the conditions of their study. DHA in the present study not only failed to affect sulcal caries but noticeably potentiated smooth surface caries. To date, no clinical studies on caries in human beings have been reported using either DHA or its sodium salt.[43]

It has been reported that SLS and the sodium salt of DHA are retained by the dental plaque[19, 43] and that SLS is also retained by freshly extracted human teeth.[44] If, therefore, retention of SLS on the teeth and its ability to inhibit anaerobic glycolysis[35] are important for cariostasis, then a maximal effect would obtain when SLS is incorporated in the diet, since it would be present in the oral cavity each time the diet is consumed.

SUMMARY

The effect of sodium lauroyl sarcosinate (SLS) and dehydroacetic acid (DHA) on sulcal caries induced by a cornmeal-sugar diet and on smooth surface caries induced by an autoclaved skim-milk powder diet has been studied in the white rat.

A significant reduction in the severity of carious lesions of the occlusal sulci resulted from the addition of 0.5 per cent SLS to Diet 585, and this inhibitory effect of SLS appeared to be independent of its detergent properties. Both the incidence and severity of carious lesions on the buccal and lingual surfaces, induced by Diet 636, were also significantly inhibited by SLS in the diet.

The effect of DHA on the caries pattern varied with respect to the two types of diets in which it was incorporated. It appeared to have no effect on the sulcal type of caries induced by Diet 585, but had a noticeably potentiating effect on the severity of buccal and lingual caries induced by Diet 636.

The presence of DHA in the diet reduced food consumption and caused a concomitant, low average daily gain in body weight. The limit of tolerance of DHA by the white rat was about 0.1 per cent in the diet, and approximately 0.5 Gm. per kilogram body weight was invariably fatal.

41. Losee, F. L., and Nemes, J. L. Human type caries distribution in Osborne-Mendel rats kept on heated skim-milk powder diet. Proc. Soc. Exper. Biol. & Med. 87:429 Nov. 1954.

42. Volker, J. F.; Apperson, L. D., and King, W. J. Influence of certain plaque absorbed agents on hamster caries. (Abst.) 34:733 Oct. 1955.

43. Fosdick, L. S. Enzyme inhibitors as a factor in control of dental caries. J.A.D.A. 52:9 Jan. 1956.

44. Rosenthal, M. W.; Marson, L. M., and Abriss, A. Some laboratory observations on the chemical, bacterial and enzymatic properties of sodium-N-lauroyl sarcosinate. J.Den. Children 21:194 third quarter 1954.

Dentistry—an aid in disaster

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For human beings, existence depends on the ability to meet and withstand unforeseen and unpredictable events. Some events occur by chance; others result from the plans and designs of people. But the occurrence of such events is commonly accepted, and human beings survive because they plan and prepare for events even though they cannot tell when the events will occur.

One type of event which must be anticipated and for which preparation must be made is a disaster. Disasters may be of natural origin, such as floods, hurricanes and similar phenomena, or may be precipitated by human actions. In the latter category could be grouped bombings with atomic or thermonuclear weapons. But, whether natural or designed, disasters produce the same kind of results. There are mass casualties, loss of power, loss of water and failure of mechanical communications. The dependence of society on these commonplace items of civilization and the lack of personnel trained to care for casualties make casualty treatment under disaster circumstances a major problem.

Such possibilities raise the question, What should be the relation of the dentist to casualty treatment in event of disaster? The answer presented here falls into three parts. First will be considered the problems associated with adequate casualty treatment under disaster conditions. Next, attention will be given to the part which the dental profession might play in such circumstances. Finally, as a source of suggestions for casualty treatment training, a brief review will be made of the training program of the Navy.

ATOMIC DISASTER

A realistic approach to the consideration of disaster conditions will emphasize one conclusion. It is simply this: attack by atomic or thermonuclear weapons must be included among those disasters for which preparation must be made. The fact is commonly accepted that a tornado or a hurricane may strike during the year. The fact must also be faced, preposterous, farfetched and impossible as it sounds, that an atomic attack on this community is a distinct possibility. The country is faced by an enemy who, it must be believed, would not hesitate to make such an attack if he thought it would give him a decisive advantage. There has been no assurance from any military quarter that a bombing could be wholly diverted or prevented. For such an attack there would be far less warning than for a hurricane, and survival would depend in part on the nature and extent of the preparation made for it.

More detailed consideration indicates

The opinions and assertions contained herein are the private ones of the writers and are not to be construed as official or reflecting the views of the Navy Department or the naval service at large.

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that after a major disaster such as an atomic attack there would be thousands and thousands of casualties. In a city of 250,000, for example, 180,000 casualties can be expected. These would result from traumatic injuries, burns, radiation injuries, or from combinations of such injuries.

TYPES OF INJURIES

Traumatic Injuries • The traumatic injuries would be either the direct or the indirect result of the blast. The direct result would, of course, be tempered by the intensity of the bomb, the distance of the individual from the center of detonation and the protection the individual may have had. Records available from the bombings in Japan indicate that direct bodily injuries produced by the initial blast, except for those near ground zero, are practically negligible. At Hiroshima there were not more than 100 ruptured eardrums observed and no instances of lung trauma or ruptured viscera from the direct blast were reported.

The indirect results, however, present an entirely different picture. The secondary effects of the blast, by demolishing buildings and projecting masonry, timbers and glass through the air at high velocity, produce thousands of casualties. At Hiroshima it was the secondary effects that produced the greatest number of deaths and injuries caused by fire, falling walls, and imprisonment by collapsed buildings.

Burn Injuries • Burn injuries would be produced directly by thermal radiation or indirectly by secondary fires. From the center of detonation a high intensity heat flash radiates in all directions. It is probably of less than three seconds' duration, but may produce first, second, or third degree burns or even charring of the body, depending on the proximity of the blast. The thermal flash travels in straight lines and therefore does not envelop the body. Except in close proximity to the blast it does not penetrate, and may be screened by light clothing or even paper. Principally, those portions of the body which are directly exposed will be affected. The so-called "profile burns" are produced by the shadowing effect of clothing and other intervening materials. The flash is purely thermal in character and is not ionizing radiation.

Burn injuries might be caused indirectly by secondary fires. Such fires would be caused by ruptured gas mains, overturned stoves, short circuits in the electrical system and so forth. Burn injuries from these sources would likewise be of any degree of severity and would be a serious problem by reason of their numbers.

After the flash, temporary blindness may occur from loss of the visual purple in the retina. As a rule this substance promptly returns and sight is regained.

Radiation Injuries • Radiation injuries, the third general classification, are not as broad in scope as is probably believed. Although the problem is widely publicized, its magnitude is far less than that of blast and burns. In Japan not more than 15 to 20 per cent of the casualties were produced primarily by ionizing radiation. The type of blast will vary the character and extent of radiation exposure. An air burst in favorable weather will cause serious damage to health within limited distances. Those radiations will probably last less than two minutes. Residual radiation would be insignificant. A surface burst, however, would produce a cloud of highly radioactive particles which might be carried for some distance. Those particles may settle on buildings, streets, people and so forth. It was this type of radiation that affected the Japanese fishermen of the schooner "Lucky Dragon." In recent months the problem of fallout has been widely discussed and sometimes misunderstood. For these reasons the following words by the U. S.

Atomic Energy Commission may be appropriate.

> In an area of heavy fallout the greatest radiological hazard is that of exposure to external radiation. Simple precautionary measures can greatly reduce the hazard to life. Exposure can be reduced by taking shelter and by utilizing simple decontamination measures until such times as persons can leave the area. Test data indicate that the radiation level, that is, the rate of exposure, indoors on the first floor of an ordinary frame house in a fallout area would be about half the level [of] out of doors. Even greater protection would be afforded by a brick or stone house. Taking shelter in the basement of an average residence would reduce the radiation level to about one tenth that experienced out of doors. Shelter in an old-fashioned cyclone cellar, with a covering of earth three feet thick, would reduce the radiation level to about 1/5000, or down to a level completely safe, in even the most heavily contaminated area. . . .
>
> If fallout particles come into contact with the skin, hair, or clothing, prompt decontamination precautions . . . will greatly reduce the danger. These include such simple measures as thorough bathing of exposed parts of the body and a change of clothing.

Mass casualties will not be the only problem to be faced in the event of atomic disaster. People are accustomed to facing the vicissitudes of life with the facilities of civilization at their disposal. Even in the event of natural disaster some of these remain for use. Moreover, in the warfare of the past—even in the saturation bombings of the cities of Europe—some facilities always remained. The city itself was never completely knocked out nor were all of its essential services destroyed.

The picture of atomic warfare in the hydrogen age is entirely different. It presents only complete havoc and utter destruction of the physical make-up of a city. In such a disaster there would be no remaining transportation system, food supplies, communications, water, sewage disposal, electricity nor anything of the sort. It is estimated that 80 per cent of the hospitals would be knocked out with but one well directed bomb in each of the target cities of the United States.

It will be readily seen that the problems of treating casualties under such conditions will be multiplied manyfold. And even before matters of facilities or supplies or personnel needed can be considered, the vital need for the greatest possible cooperation between all existing services must be recognized.

COOPERATION BETWEEN SERVICES

Although the medical problem will be of immediate concern in recovery from an atomic disaster, the success of the medical effort will be dependent on full cooperation between the health services and the other services in the civil defense organization. Transportation, supply, communications, water, sewage disposal, electricity and shelter are but a few of the essentials of medical treatment which must be supplied by other services. It is important that the medical, dental and nursing professions, those holding key positions in the recovery team, have an understanding of the problems and limitations of other services so that the smoothest functioning of all toward the common goal may be effected. In the absence of many services which are normally taken for granted, personnel concerned with medical recovery will have to improvise and rely on their own resources. The realization will be necessary that each has his own difficulties, that each must rely on himself and that each will help the other as much as possible. This is primitive living, but it may make survival possible.

It has been said that the nation's ability or inability to cope with the medical problem associated with atomic disaster may well determine its survival or nonsurvival. Adequate handling of that problem will mean returning industrial workers to assembly lines, and firemen, public utility men and others to essential duties with a minimum loss of man hours.

A fairly accurate prediction can be made for the types and numbers of casualties anticipated in any given target area. From these predictions it is possible to determine the need for supplies, such as dressings, drugs and instruments, locations of treatment centers, and routes and methods of evacuation. On the basis of such computations the federal government has stocked 15 emergency warehouses with medical supplies that will care for two and one half million casualties for three weeks. However, it will take four to eight hours for the various cities to obtain these supplies. Seven hundred improvised hospitals of 200 beds are on order at a cost of $26,000 each. Six thousand will be needed. Each hospital is a complete unit in itself, consisting of 20 wards, a 15 kilowatt generator, polaroid x-ray, nylon water tank and sterilizing room. The unit weighs 13,000 pounds and can be carried on one trailer truck. Thirty people can assemble it in four hours. It has been calculated that a city of 180,000 people with an estimated 125,000 casualties would need 300 of these units. Facilities of this nature would lend considerable mobility to a medical care program. These preparations emphasize that the success of the medical effort would depend on improvisation and cooperation in its broadest sense.

But supplies and facilities are of no value in disaster unless trained personnel are available to put them to proper use. Estimates have been made of the number and type of personnel needed to provide adequate medical care for anticipated casualties. It is calculated that 100 first aid stations, each manned and supported by approximately 235 trained workers, will be required to care for 100,000 casualties. These figures, which do not include those trained workers who have become casualties themselves, indicate a requirement of approximately one trained person for every four casualties. In Chicago, that would mean 900,000 trained personnel who themselves were unharmed to provide the necessary assistance in handling the injured.

ROLE OF DENTIST

The problems associated with treatment of casualties under atomic disaster conditions may be subsumed, therefore, under three heads: facilities, supplies and trained personnel. The next question is, What part would the dental profession play in such circumstances? Since the need for everyone who is even remotely associated with any of the health services to ally himself with the civil defense effort can be understood readily, the role the dentist can play emerges clearly. As a health profession with a valuable advanced casualty care potential, dentistry has a responsibility to contribute a large part of well trained personnel.

The background of the dentist identifies the profession as the best prepared, the largest and most available group to amplify and extend the services of the physician. The 90,000 dentists of this country, with their sound basic medical science training, experience in handling patients under conditions of extreme pain, close association with medical colleagues in the mutual care of patients and ability to remain levelheaded and exercise calm judgment in emergencies, are qualified as a group of able assistants to medical men in providing emergency casualty care.

The dentist can provide assistance in any one of three ways. He may provide direct emergency care through administration of anesthetics, parenteral therapy, or the treatment of wounds, burns, shock or radiation. Secondly, he may provide administrative assistance, perhaps by sorting and classifying casualties, by organizing groups for cooperation of effort or by arranging for provision of needed facilities and supplies. Thirdly, he may train others in casualty treatment. But whatever avenue his efforts

might take, he should be able to provide emergency casualty treatment whether it be only for members of his own family and perhaps his neighbors, or for many others beyond his personal associations.

A consideration, however, of the services which the dentist might render in emergency should afford this distinction. To say that the dentist is better qualified than others to extend the services of the physician is not to say that he is able to do it. Just as clinical practice is necessary to develop the skill required for practicing dentistry, so practical training in casualty treatment is needed to develop the skills which would be demanded in a disaster situation with its attendant hysteria and absence of controls.

If dentists are to be expected to act in a capacity which is outside their normal professional services, and in which they have had little or no practical experience, they must have proper and extensive training to prepare them to accomplish satisfactorily the expected actions.

If this point of view is accepted, the question becomes, How shall the dentist be trained for the role he is expected to fill?

TRAINING PROGRAM

Perhaps the most important consideration is the planning and formulation of a training program. It should be carefully considered and planned as a whole, for the types of training which are adopted and the manner in which they are used will determine the program's success. No recruiting drive should be undertaken until a worthwhile training schedule has been set up, because nothing will discourage a group more quickly than a poorly planned program.

If the question is raised of the courses which would be appropriate, it may be assumed that the initial course would be training in first aid.

The first aid training should be followed by advanced instruction in emergency casualty care. This may be arranged through cooperation of the local medical societies, medical or dental schools. A good, sound course in field anesthesiology should be a part of this training program. In addition, the American National Red Cross has arranged for special courses to be given to dental societies and groups of dentists. These will be taught on a professional level and, whenever possible, professional teachers will be provided. Every Red Cross chapter in the country has been notified of this program and is ready to set up courses whenever requested. If difficulties arise in making arrangements for Red Cross courses, cooperation will be assured by contacting the dental consultant in the Federal Civil Defense Administration in Battle Creek, Mich. Training under rescue conditions at the Federal Civil Defense Administration School at Olney, Md., is available. Key personnel should take the administrative course at Battle Creek, Mich., to understand better the functioning of the various components of the entire civil defense organization. Courses of instruction should be followed by personal observation in handling accident cases in hospital emergency receiving wards or even riding the ambulance to the scene of accidents. There, dentists may see the practical measures of relief performed by physicians or other well trained first aid personnel. Russell Bunting describes the plight of the dentist as "without portfolio"; he has the background but is lacking in methods. In addition, it should not be forgotten that refresher courses should be held from time to time to hold the group together, to develop esprit de corps, and to maintain group efficiency at a high level.

Instructors for all courses should be the best obtainable to maintain a high interest level in a "noncaptive" group.

Sometimes the basic technics of lifesaving and immediate casualty care can best be taught by selected laymen—fire-

men, rescue squad personnel, policemen and first aid workers who have had practical experience in administering these services. They have learned their treatments from actual casualty care at the scene of disasters or accidents. Qualified medical teachers are usually available to review and demonstrate both the methods of treating traumatic injuries, such as shock, hemorrhage, burns and fractures, and also the technics for venipuncture, blood transfusion, tracheostomy and so forth. It might be suggested that those men who have had combat experience are probably best qualified to teach because of their battlefield background. The "multiplier principle" should be fully utilized, that is, ten people should be trained, each of whom would train ten others, and so on. Full use should be made of FCDA training materials, such as books and pamphlets. Films are available for loan from the Federal Civil Defense Administration and the American Dental Association.

In Detroit a successful training program for dentists has been carried on by an oral surgeon. Under his direction over 400 dentists have been given casualty treatment training in hospitals. Oral surgeons provide an excellent source of teachers for the dental profession because of their extensive hospital experience, their close association with their medical colleagues, their care of wartime casualties and the actual combat experience many of them have had.

Some general practitioners of dentistry compiled excellent records for the profession during World War II in their handling of combat casualties. On several occasions the regimental or unit medical officer was killed and the dental officer was left to direct or provide the casualty care. Those who had had previous training carried on admirably; those who had no previous training applied their basic medical sciences and became experienced in a hurry, earning "well done."

On many occasions it became the duty of the dentist to serve as anesthetist for the surgeon in the handling of combat casualties and this help greatly amplified the amount of treatment carried on by the physician.

U.S. NAVAL DENTAL SCHOOL CASUALTY TRAINING PROGRAM

This brief discussion of training for the part which a dentist might play in event of disaster brings the discussion to a closely related topic and the final point under present consideration. A review of the Navy's program for training in casualty treatment is presented, not because the program is presumed to be the superior training course in all the land, but rather because it represents the best efforts of a group of professional men to achieve a similar objective—preparation for survival in case of disaster. This review of Navy training is offered simply to make available information which anyone may wish to utilize in devising a program.

The training course described here has been developed over a period of several years by the U. S. Naval Dental School. Instructors for the course are naval dental officers and course materials have been selected from available literature, FCDA materials, Navy films and other training aids. The 30 hour course of instruction includes lectures, demonstrations, films, practical application of first aid procedures on trainees and practical application of procedures on available training aids. Practical trainee participation is stressed.

Lectures • The lectures cover the following subjects:

1. Basic structure of civil defense and its application to the Navy.
2. The effects and potentialities of nuclear weapons.
3. First aid equipment, supplies, and their use.

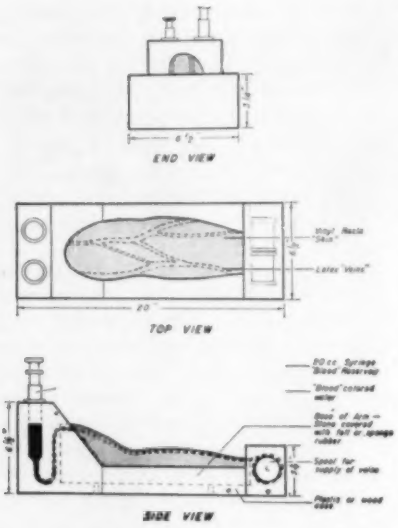

Fig. 1 • Facsimile arm

4. Various categories of wounds, such as head and neck, chest, abdominal and internal.
5. Control of arterial and venous hemorrhage.
6. Treatment of open and closed fractures.
7. Management of maxillofacial injuries.
8. Emergency opening of closed airways.
9. Burns.
10. Shock.
11. Parenteral therapy.
12. Medicaments.
13. Bandaging and splinting.
14. Resuscitation.
15. Transportation of injured.

Practical Training Aids • During and after the lectures, training aids are used for practical application of the subjects. Extensive use is made of a facsimile arm, neck, abdomen and body, all of which were developed at the U. S. Naval Dental School in Bethesda.

The facsimile arm was designed and constructed as a section of a model arm, complete with simulated skin, vessels and blood (Fig. 1, 2). To construct this training aid an impression is taken of the inner surface of a forearm and elbow. From this impression a one piece linotype metal mold is made, against which the vinyl resin "skin" is processed. A plaster model of the inner forearm and elbow area, mounted in the frame for the device, is covered with felt to a thickness of one half inch. Latex rubber tubes are laid along the arm in positions approximating those of major blood vessels. The "skin" is positioned snugly over the arm, clamped down by its lower edges. The lower ends of the tubes are wound on spools to provide replacement lengths that can be pulled through from the upper ends as required. The upper ends of the tubes are connected to two 20 cc. syringes, which are filled with facsimile blood, mounted and exposed to show changes in fluid level. The fluid used to simulate blood is a solution of glycerin, water and vegetable dye. When a trainee practices with this device he must locate a "vessel" by palpation. The "skin" offers rather realistic resistance to penetration. Accuracy of the insertion can be checked, since fluid withdrawn will appear in the syringe and injected

Fig. 2 • Facsimile arm in use

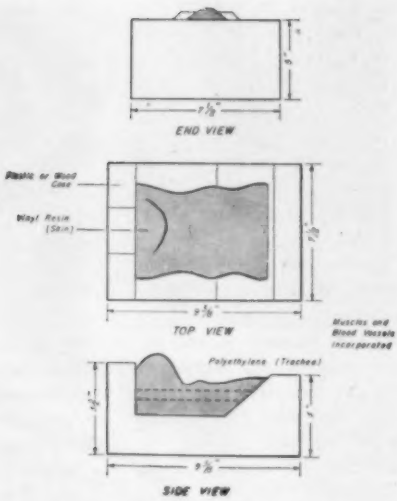

Fig. 3 • Facsimile neck

fluid will cause the level in the mounted tubes to rise.

It is estimated that the vinyl resin skin over a tube will last through several thousand trial injections. As the area begins to show wear the tubes can be repositioned slightly to lie under a fresh adjacent area.

The following needle technics can be taught with this device:

1. Intramuscular.
2. Subcutaneous.
3. Intravenous.

As a training aid for instructing naval personnel in emergency tracheostomy, the facsimile neck was designed and constructed with simulated skin, muscles, cartilage, trachea and blood vessels as previously described for the facsimile arm (Fig. 3, 4).

Although the texture and structure of the model neck and its trachea, vessels and muscles approximate only roughly those of a natural neck, the trainee can locate landmarks of the neck by palpation when he uses it. The "skin" offers rather realistic resistance to penetration and incision, and the "feel" of performing a tracheostomy on this training aid is realistic.

In teaching advanced first aid it was necessary to teach procedures in clamping blood vessels, tying blood vessels, suturing and bandaging. To provide a lifelike training aid for this instruction, a facsimile abdomen, complete with skin, adipose tissue, muscles and blood vessels was constructed (Fig. 5).

The training aid consists of four major portions:

1. Facsimile abdomen.
2. Motor for "arterial" and "venous" pressure.
3. Reservoir for the simulated blood.
4. Base, and veneer cover.

The facsimile abdomen consists of three layers of sponge rubber, of which two are one half inch layers and one is a one fourth inch layer, cut to proper size. The three layers of rubber are assembled in the following sequence; one one half inch layer on the bottom; one one half inch layer in the middle and a one fourth inch layer on top. Before assembling, a thin layer of skin-colored vinyl resin is cured on the outer surface of the one fourth inch foam rubber. The vinyl resin is cured by placing it under a heat lamp and later into a dry heat oven.

Fig. 4 • Facsimile neck in use

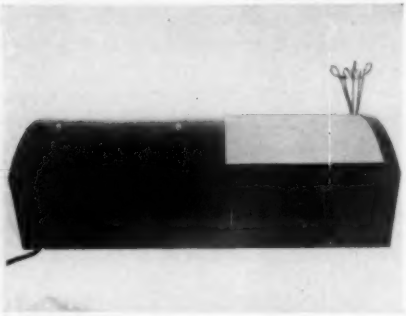

Fig. 5 • Facsimile abdomen

Various-sized latex rubber tubes are placed between the layers of foam rubber, and the latter are covered with rubber cement. The assembled foam rubber, latex tubes and vinyl resin are pressed firmly together to allow the rubber cement to bond the layers and tubing together. At one end the latex tubes are cut and tied off to seal them up. At the other end they are left long to facilitate their attachment to the supply tank of fluid. The supply tank has ten outlets for the "venous" system of latex tubing. The latex tubes are forced over the serrated outlets.

Three "arterial" outlets are used in a similar manner. The closed tank is supplied with a continual steady air pressure from the small electric motor and air compressor. The arterial supply and pressure passes through an oscillating cylinder to create a "pulse" which in turn branches in three outlets for the "arterial" flow.

The supply tank is a closed unit with an airtight opening for replenishing the colored facsimile blood. The air intake to the tank is connected to the pneumatic pump by a rubber hose.

The motor and pneumatic pump are of the type used with pneumatic instruments in dentistry, modified to produce an interrupted flow to simulate a pulse. The speed of the motor is controlled by a rheostat to control the "pulse" beat.

The facsimile abdomen is supported by a plywood arch which is secured to the base. There is a metal covering over this area to catch escaping fluids during the use of the training aid.

The entire mechanism is secured to a base of plywood. The shell is made of formica and plywood.

An opening is left in the cover for easy access to the mechanism. The rheostat adjustment is easily accessible on the top.

The incision should be started at the far end of the facsimile abdomen and, as the "arteries" and "veins" are clamped and tied and the "wound" sutured, the next incision should be accomplished toward the motor side of the facsimile abdomen. Once the entire area has been used, a new, previously assembled facsimile abdomen is attached in position.

The facsimile body, or manikin, incorporates in one unit the training aids which have been described, and includes others in addition (Fig. 6).

The body of the manikin is made of plastic reinforced with Fiberglas, fabricated from a sculptured model, and positioned to facilitate the demonstration of various first aid problems. The "skin" over the basic body is fabricated from molds made from a human donor. The material is a vinyl plastic cured in

Fig. 6 • Casualty treatment training manikin

Fig. 7 • Fluid-activating mechanism

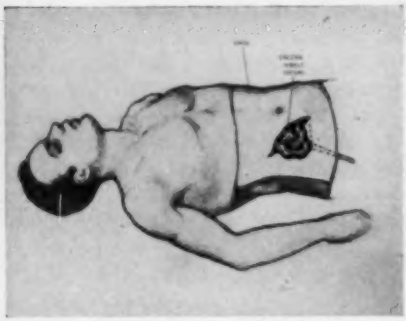

Fig. 8 • Representative mold

dry heat in metal molds. The simulated blood is activated by a centrifugal pump from which individual adjustments control the rate of flow of the fluid of each individual simulated wound. The fluid is collected in drains; then it is returned to the storage tank to be used over and over again. The clothing is fitted with snap fasteners to facilitate removal for laundering.

The manikin can be used to demonstrate and explain emergency casualty treatment appropriate for:

1. Choking and oral hemorrhage caused by a depressed fracture of the anterior portion of the mandible.
2. Choking caused by a foreign body in the throat; and procedure for an emergency cricothyroidotomy.
3. A penetrating chest wound.
4. An abdominal wound.
5. An arm wound (arterial).
6. A leg wound (venous).
7. Open and closed fractures.
8. Burns.
9. Shock (venipuncture arm).
10. Pressure points.

For naval stations or activities that do not have the use of a manikin, a simplified training aid has been developed. The problems incorporated in the manikin are duplicated in individual vinyl resin molds which are strapped on a volunteer. Individual molds cover the following problems:

1. Head wounds.
2. Chest wounds.
3. Abdominal wounds.
4. Open and closed fractures.
5. Arterial and venous bleeding.
6. Burns.
7. Facial wounds.
8. Airway problems.
9. Shock.
10. Traumatic amputation.

The molds are connected to the central fluid supply by rubber tubing. The central fluid supply is mechanically able to create a venous or arterial flow to the simulated wounds (Fig. 7).

The molds are, as before, vinyl resin cured in dry heat against metal molds. Any type of wound can be incorporated in these body sections. An adjustable elastic back on the mold keeps it fitted tightly against the volunteer (Fig. 8).

The mechanical "heart" is made of stock parts for ease of control and repair.

COMMENT

This review of Navy training for casualty treatment shows what is being done now. The program is under constant study, however, in an effort to improve it in every way possible. It serves, perhaps,

to illustrate the relation of the dentist to casualty treatment in event of disaster and to suggest the critical importance of the contribution which potentially he can make.

In closing, the great urgency of the situation should be stressed. Immediate action is needed. The dentist should not wait for someone else to start procedures or remain inactive until some group asks him to participate. Dentists, both as individuals and groups, must initiate actions themselves. An appropriate and easy place to start is in their own homes. From here they can direct their efforts toward personal immunization and make basic preparations for shelter, food and first aid. The time to do it is now.

Ultrasonic removal of tooth structure 1. A histopathologic evaluation of pulpal response in monkeys after ultrasonic cavity preparation

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Ultrasonic technics have been utilized by industry for a considerable length of time in the cutting of materials such as glass and metals. Because of the success of this method, the possibility of adapting such a procedure to the requirements of operative dentistry has been under scrutiny in recent years.[1-4] Oman and Applebaum[5] have indicated that this method of removal of tooth structure meets the exacting requirements of proper cavity preparation and also offers advantages with respect to patient comfort. The tissue changes after ultrasonic methods of cavity preparation have been used, however, have not been sufficiently clarified to warrant acceptance of this technic on other than an experimental basis.[6] The few reported histologic examinations of human teeth do not reveal any differences in pulpal response when ultrasonic procedures are compared with bur technics in cavity preparation.[7] Conversely, the severe pulpal reactions that were reported

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by Hansen and Nielsen[8] after studying the continuously erupting incisor of the guinea pig emphasizes the need for an exceedingly thorough scrutiny of this biologic phase.

As a portion of the U. S. Air Force dental research program to evaluate newer devices and technics for the more efficient removal of tooth structure, the dentitions of seven rhesus monkeys were utilized in an attempt to delineate variations in pulpal response found after ultrasonic and conventional cavity preparation procedures. This primate was selected since the teeth are similar to those of the human.

METHODOLOGY

The five male and two female primates employed in this study varied in weight from 11 to 19 pounds. The general anesthesia necessary for the institution of dental operative procedures was obtained by intravenous injections of pentobarbital sodium (1 grain per five pounds of body weight). The dentition of each animal was divided contralaterally into two groups, each group consisting of approximately 12 teeth, the third molars being excluded from this study. Cavities were prepared in 164 teeth, one half of the preparations being occlusal in type, while the remainder were located on the labial or buccal surface in the cervical third of the crown.

In one group, cavities were prepared using carbon steel burs mounted in a Chayes handpiece and rotating at approximately 8,500 rpm. Coolant effects were obtained by employment of a Hanau water spray during bur rotation. A Cavitron unit was used for cavity preparations in the remaining group of teeth in each animal. Tuning resonance was attained at 24 KC, and an aluminum oxide slurry was used as an abrasive in accordance with manufacturer's instructions. A zinc-free amalgam was employed as filling material in all instances to negate any expansion that might result from gingival seepage.

Two of the experimental animals were sacrificed 24 hours after operative procedures; two after 7 days; two after 30 days; and the final one after the expiration of 60 days. After sacrifice, the teeth were extracted and fixed in Formalin. Celloidin sections were prepared subsequent to formic acid decalcification at the Dental School, University of Minnesota (AF Contract no. 18 (600)-949).

Histopathologic examinations were undertaken independently by participating pathologists without knowledge as to time intervals between cavity preparation and sacrifice or of cutting technics employed. Evaluation was based primarily on the integrity of the odontoblastic layer, the appearance of the pulp, and the extent of secondary dentin formation.

In order that a more reliable statistical evaluation would result, a general impression of reaction severity of each specimen was formed and recorded. These recordings ranged from one plus when only a slight reaction had occurred to four plus when severe reactions were observed (Fig. 1). When a pulpal exposure was noted, either in the clinical preparation or in the histopathologic review, the plus recording was not included in the over-all evaluation. It was felt that alterations in these teeth were primarily a result of the exposure and that the particular operative technic could not be held responsible therefor.

RESULTS

In the two monkeys sacrificed after a 24 hour interval, no secondary dentin formation associated with the cavity preparation could be discerned. This was as could be expected inasmuch as it normally takes approximately two weeks

8. Hansen, L. S., and Nielsen, A. Comparison of tissue response to rotary and ultrasonic dental cutting procedures. J.A.D.A. 52:131 Feb. 1956.

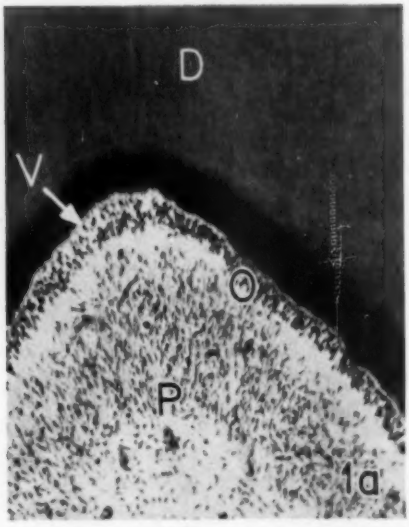

Fig. 1 • Odontoblastic layer under area of cavity showing vacuolization. D: dentin; P: pulp; O: odontoblastic layer; V: vacuoles. One day

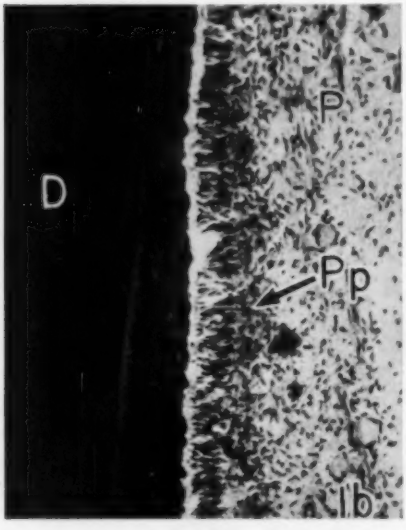

Fig. 2 • Slight proliferation of pulpal elements beneath area of cavity (Pp). One week

for the formation to progress to appreciable proportions. The majority of these specimens demonstrated a slight vacuolization of the odontoblastic layer (Fig. 1) as well as a tendency of some odontoblasts to assume cuboidal morphology. The pulpal components appeared normal, with the possible exception of a questionable slight hyperemia or edema seen in a few slides of each group. A few polymorphonuclear cells were noted occasionally. Summation of the distribution of severity of pulpal reaction is shown in the table.

A study of the teeth of the two animals sacrificed after a seven day interval demonstrated either no secondary dentin or a very slight formation. Vacuolization of the odontoblasts was more pronounced, and a loss of polarity was noted in some of these cells (Fig. 2). A proliferation of pulpal cells was observed immediately beneath the area of the dentin tubules involved by cavity preparation. This tended to obliterate the zone of Weil, but was noted equally in both groupings. Pulpal reaction was minimal with a questionable hyperemia and edema being noted in only a few specimens. The variations between the two groups, as reflected by plus readings, were minimal (see table).

The teeth of the two primates sacrificed after 30 days demonstrated the first pronounced secondary dentin formation. Directly beneath the area of the tubules severed in cavity preparation, a slight to moderate formation could be seen (Fig. 3). Slight vacuolization of the odontoblastic layer was also noted, and again local proliferation of the pulpal elements obliterated the zone of Weil. Hyperemia was more positive in a few instances. New capillaries were noted in the odontoblastic layer. As can be discerned from the statistical recording of the general impression, alterations were more pronounced than in the two previous groups of animals.

The one 60 day animal demonstrated changes much on the order of those seen

in the 30 day group, except that the alterations were more pronounced. Secondary dentin formation was more noticeable, ranging from slight to advanced. Vacuolization was more severe, and more frequent areas of chronic inflammatory response supplemented the previous findings of hyperemia, edema and proliferation of pulpal elements.

Manifestations of advanced pulpal degeneration were noted in three of the 30 day specimens and in one of the teeth in the 60 day grouping. These were characterized by coronal pulp abscesses (Fig. 4) surrounded by areas of polymorphonuclear leukocytic infiltration. Reticular atrophy was also noted in the pulps of these teeth.

DISCUSSION

This has been a short term investigation to determine the extent, if any, of the histopathologic changes induced by ultrasonic cavity preparation, as compared with those resulting from conventional bur usage. Even though only seven animals were evaluated, the total number of teeth studied does provide a reasonable basis for extrapolation of the effects that might be expected in man.

As can be seen in the table, the over-all effect of bur cavity preparation was slightly less noticeable than that noted after ultrasonic procedures. It is doubtful whether this difference can be considered significant in view of the small number of animals utilized and the possible human variation in impression recording.

The major pulp pathologic conditions were distributed almost equally between the two groups, and the slight differences in plus recording were dependent on minor variations in secondary dentin formation, small alterations in the integrity of the odontoblastic layer, and minor pulp changes. Although longer term studies are indicated before these minor discrepancies can be considered completely inconsequential, it might be

Table • Number of teeth and severity of pulpal reaction to ultrasonic and bur technic used in cavity preparation

Sex	Time Interval	Method	Dentin				Odontoblasts				Pulp				General impression of severity:		
			No. of teeth	No. plus readings†	Average												
			*N	†S	‡M	§A	N	S	M	A	N	S	M	A			
M	1 day	Bur	11	—	—	—	4	7	—	—	5	6	—	—	11	8	.7
		Ultrasonic	11	—	—	—	1	10	—	—	2	9	—	—	11	12	1.1
F	1 day	Bur	13	—	—	—	4	9	—	—	11	2	—	—	13	11	.8
		Ultrasonic	13	—	—	—	4	9	—	—	13	—	—	—	13	10	.8
F	1 week	Bur	6	2	1	—	1	7	1	—	4	5	—	—	9	8	.9
		Ultrasonic	6	4	—	—	1	8	1	—	5	5	—	—	10	14	1.4
M	1 week	Bur	10	—	—	—	6	4	—	—	5	5	—	—	10	8	.8
		Ultrasonic	10	—	—	—	2	8	—	—	4	6	—	—	10	8	.8
M	1 month	Bur	4	7	3	—	1	13	—	—	5	8	1	—	14	23	1.6
		Ultrasonic	3	7	2	—	1	10	1	—	1	9	2	—	12	29	2.4
M	1 month	Bur	1	3	10	—	0	11	3	—	4	7	2	1	14	32	2.3
		Ultrasonic	3	3	7	—	2	9	1	1	7	2	2	2	13	29	2.2
M	2 months	Bur	3	3	5	1	0	5	5	2	1	8	3	0	12	31	2.6
		Ultrasonic	3	—	5	4	0	7	2	3	0	8	3	1	12	35	2.9
Totals		Bur	48	15	19	1	16	56	6	5	35	41	6	1	83	121	1.4
		Ultrasonic	49	14	14	4	11	61	4	4	32	39	7	3	81	137	1.7

*N=None to slight reaction noted.
†S=Slight to moderate.
‡M=Moderate to advanced.
§A=Advanced.

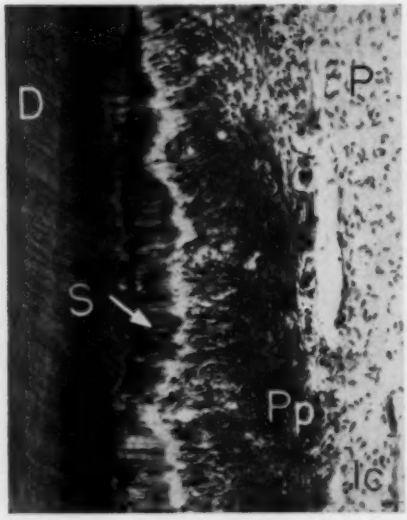

Fig. 3 • Odontoblastic layer under area of cavity showing secondary dentin formation. S: secondary dentin formation; Pp: proliferation of pulpal elements obliterating zone of Weil. One month

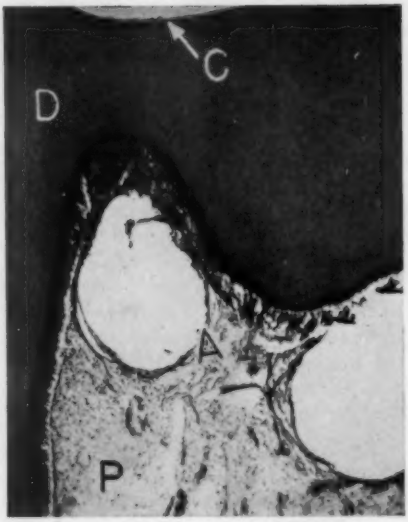

Fig. 4 • Microabscesses of pulp under area of cavity. C: cavity preparation; A: necrotic area and acute inflammation. Two months

noted that after a two month period subsequent to operative procedures, there is usually little further change in pathologic condition.[9] Changes seen during the course of this experiment, although of short duration when compared to the lifetime of the animal, are of long-term significance when considered in comparison with normally anticipated pulpal reactions.

SUMMARY

1. The dentitions of seven rhesus monkeys were utilized in a histopathologic evaluation to determine comparative pulpal reactions after the use of ultrasonic and conventional bur technics in cavity preparation.

2. The pulpal reactions to each technic demonstrated only minor differences that could not be considered significant.

3. This study, although clarifying various aspects of pulpal response to the ultrasonic cutting technic, does not obviate the need for similar longer term experimentation.

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9. Zander, H. A. Personal communication.

Halitosis

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Halitosis may be defined as an unpleasant or offensive breath. Synonyms are "fetor ex ore," "fetor oris," and "bad breath." The term is derived from a Latin word *halitos,* meaning breath, and the suffix *osis* which means an abnormal or diseased condition.

Occasionally the term "true halitosis" is used to describe odors arising from the intestinal tract, and "fetor ex ore" used to designate odors from the mouth and adjacent structures, but this distinction does not appear justifiable. Actually, the odor on a patient's expired air can come from the lung, trachea, nasopharynx, oral cavity or any combination of these regions.

The human breath normally is free of offensive odors, and has a slightly sweetish, characteristically human odor.[1,2] Slightly unpleasant odors can be detected in most adults, and in a high percentage of instances (one author reported 65 per cent) the breath has a definitely unpleasant quality.[3]

An offensive breath is a functional disorder apt to occur at all periods of life. Men are more subject to it than women, and it is a prominent symptom of many morbid conditions. Howe[4] wrote in 1874 that an offensive breath:

> . . . derives its importance from the fact that it is a constant source of misery to all who, by force of circumstances, are compelled to associate with the unfortunate patient. In its worst forms it effectually destroys the communion of friends, and the pleasures of social contacts. Even the harmony of the home-circle is invaded by a feeling of repugnance, which the best of us can scarcely control. Yet how few of the afflicted persons detect the cause of their isolation, or recognize the barrier which effectually prevents the approach of those near and dear to them! With the best intentions in the world, we rarely whisper a word of their disorder or suggest a source of relief. This false kindness—this demoralizing weakness—is universal.

ODOROLOGY

The science of olfaction is not an exact one, and there are no acceptable definitions of odor. It can be stated that an odor is that which can be smelled and that to smell is to perceive odors by using the nerves and sensory cells in the nose, but that, of course, is no definition. It is easier to understand odor than to define it. Odor can be defined as that quality of a substance or a mixture that can be perceived by inhalation through the nose or by the nose through the mouth without physical contact with the substance except in its volatilized form. This definition is faulty, however, because materials that

Paper read at the alumni meeting of the Medical College of Virginia School of Dentistry, Richmond, Va., January 31, 1956.

Dean, Indiana University School of Dentistry.

1. Hawxhurst, D. C. Offensive breath. D. Register 27:104, 1873.

2. Crohn, B. B., and Drosd, R. Origin of mouth odors—halitosis. New York J. Den. 12:192 May 1942.

3. Morris, P. P., and Read, R. R. Halitosis: variations in mouth and total breath odor intensity resulting from prophylaxis and antisepsis. J. D. Res. 28:324 June 1949.

4. Howe, J. W. The breath and the diseases which give it a fetid odor. New York, D. Appleton and Co., 1874, p. 7, 8.

choke or are irritating can be perceived by inhalation through the nose but may be odorless.

Several questions about odors apparently have not been answered satisfactorily:

1. Does a flower have an odor if no one is around to smell it?
2. A substance can be detected by the sense of smell of a few men but not by that of most. Is it correct to say a substance is odorless to one man who cannot smell it but not to another who does?
3. A substance can be detected by a sense of smell of animals but not by men. Does it have an odor?

Obviously such questions cannot be answered until an acceptable definition of odor is found. This problem exists because thus far scientists have not been able to analyze or measure many of the odors except with the use of the olfactory epithelium of some person. In other words, the measurement of an odor cannot be related to a perceptual mechanism as can vision to light waves or sound to sound waves or heat to calories.

It is believed by many that odor is not a property inherent in a substance but is a quality that exists by virtue of a relationship between the material and the perceiver. Hence it can be argued that if there is no perceiver there is no odor.

This is an academic viewpoint, but in discussing odors it is necessary to point out that what is a strong odor to some is no odor at all to others. The quantity of material in the air which arouses a response may be too minute to be measured by the usual quantitative tests; many odors are easily perceived by sensitive olfactory epithelium that cannot be detected by routine physical or chemical methods.

Probably the definition of odor made by Sagarin[5] is as good as any:

> Odor is the property of a substance or substances that is perceived in the human and higher vertebrates by inhalation in the nasal or oral cavity that makes an impression upon the olfactory area of the body and that during and as a result of such inhalation is distinct from seeing, hearing, tasting, or feeling, and does not cause or result in choking, irritation, cooling, warmth, drying, wetting and other functions foreign to the olfactory area.

A few other definitions may be of interest:

"Masking an odor" implies the introduction of a new odor which is stronger, and usually less unpleasant, than the original odor.

A deodorant may be defined as a substance which destroys or counteracts or in some way reduces the intensity of the original odor.

Substances that lead to the sensation of odor are termed "osmyls." "Osmics" is a term for the field of science concerned with smell. For these thousands of osmyls a generous language provides a wide choice in overlapping terms, including "fragrance," "aroma," "perfume," "redolence," "bouquet," "stink," "stench," "fetor," "putrescence" and "nidor."

Probably the only manner in which a valid definition and classification of odors can be made is to develop a physical or chemical method of analyzing the volatilized substance which irritates or stimulates the olfactory epithelium. Attempts to do this are being made; until such studies are complete, all that can be done is to rely on interpretations by individuals.

There are several classifications of odors, based on subjective reactions of individuals, but they are of limited value to dentistry. Two of the best known are Zwaardemaker's[6] and Henning's.[7]

Zwaardemaker's classification of odors follows:

5. Sagarin, E. Odor: a proposal for some basic definitions. In Symposium on odor. A.S.T.M. Special technical publication no. 164. Philadelphia, American Society for Testing Materials, 1954, p. 3-8.

6. Zwaardemaker, H. Odoriferous materials. In International critical tables of numerical data, physics, chemistry and technology. National Research Council. New York, McGraw-Hill Book Co., 1926, p. 358.

7. Farber, L. Chemical evolution of odor intensity. Food Technol. 3:300 Sept. 1949.

1. Ethereal or fruity: characteristic in general of fruits and due in most cases to the presence of various esters; includes also beeswax and certain ethers, aldehydes and ketones.

2. Aromatic.

a. Camphoraceous: borneol, camphor, eucalyptol.

b. Spicy: eugenol, ginger, pepper, cinnamon, cassia, mace.

c. Anise-lavender: anethole, lavender, menthol, thymol, safrol.

d. Lemon-rose: geraniol, citral, linalyl acetate, sandalwood.

e. Amygdalin: benzaldehyde, oil of bitter almonds, nitrobenzene, prussic acid, salicylaldehyde.

3. Fragrant or balsamic.

a. Floral: jasmine, lily of the valley, ilang-ilang, orange blossoms, lilac.

b. Lily: tuberose, narcissus, hyacinth, orris, violet, ionone and so forth.

c. Balsamic: vanillin, piperonal, coumarin, balsams of Peru and Tolu.

4. Ambrosial: musk and amber. This odor is present in the flesh, blood and excreta (referable to the bile) of certain animals.

The following is Henning's odor classification:

1. Spicy: conspicuous in cloves, cinnamon, nutmeg and so forth.

2. Flowery: conspicuous in heliotrope, jasmine and so forth.

3. Fruity: conspicuous in apple, orange oil, vinegar and so forth.

4. Resinous: conspicuous in coniferous oils and turpentine.

5. Foul: conspicuous in hydrogen sulfide and products of decay.

6. Burnt: conspicuous in tarry and scorched substances.

The track of aromatic substances has been outlined by Crohn and Drosd[8] as follows: After absorption from the intestines, they go to the liver, then to bile, bile to blood, blood to lungs and lungs to breath. This pathway was tested using garlic, onion, oil of peppermint, oil of wintergreen, indole and skatole, all of which can be made to appear in the breath.

The sense of smell is one of the most primitive of the primary senses, and among vertebrates in general is in many ways the most important of all the senses. From cyclostomes and sharks up through the more primitive fishes, amphibious reptiles and most mammals, smell is a main source of information concerning the outside world. The relative size of the olfactory bulbs in various animals is shown in Figure 1.[8]

In some animals the sense of smell is well developed. Fox hounds, for example, can trace not only trails of foxes, but can distinguish between trails of different foxes. Animals which have a highly developed sense of smell (rodents, ruminants and carnivores) are called "macrosmatic." Those without any sense of smell (whales) are called "anosmatic," and poor "smellers" such as man are "microsmatic."[9]

The thresholds of odor perception vary from day to day, depending on such conditions as colds, nasal inflammation, fatigue.

Olfactory epithelium quickly fatigues or in some way becomes accustomed to odors and fails to perceive them. Odor adaptation is a real and measurable phenomenon. If a patient is placed in a room in which the concentration of a given gas such as hydrogen sulfide is building up slowly, there will be a range of concentration below the person's threshold at which he cannot smell the gas; the concentration at which he does smell the gas will depend on the sensitivity of his olfactory epithelium, whether or not he has a cold, and so forth. Also, after a short time, a person will become accustomed to the odor, and he will not be aware of the hydrogen sulfide. There

8. Romer, A. S. The vertebrate body. Philadelphia, W. B. Saunders Co., 1950, p. 582.

9. Walter, H. E., and Sayles, L. P. Biology of vertebrates, ed. 3. New York, Macmillan Co., 1949, p. 774.

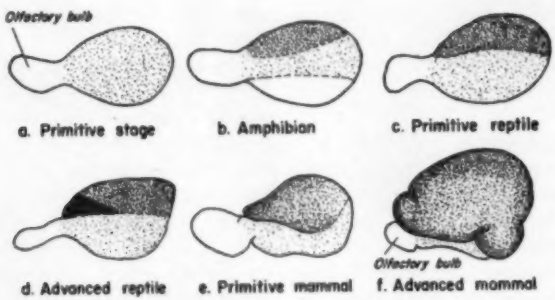

Fig. 1 • Diagram (modified from Romer[9]) of progressive differentiation of cerebral hemisphere of various vertebrates. Sketches are lateral views of left hemisphere and olfactory bulb.

is no doubt that hydrogen sulfide is in the room all during the experiment. Incidentally, this odor adaptation is specific; if a new odor is introduced, it can be perceived until the person becomes accustomed to it.

Tanyolac and Eaton[10] suggested that perhaps olfactory epithelium responds only as long as the odorous contaminant causes a change in the surface tension of liquid around the olfactory cells.

Since contact with an odor for a while renders persons insensitive to it, a substance may actually lose its odor, as far as that individual is concerned. A patient with halitosis will quickly become accustomed to it and therefore cannot detect the odor.

Much depends on an individual whether or not some odors are offensive. The most exotic of perfumes becomes offensive if it is too strong or if it recalls unpleasant associations. Pine oil is in itself rarely offensive, but since it is so closely associated with the cleaning of public toilets some people find it objectionable. The physiological aspects of the sense of smell are not understood completely.

Behind the physiology of odor perception stands a rather complex anatomical arrangement. It is generally believed that gaseous products probably stimulate the receptor end organs of the first cranial nerve, although some believe that the odorous substance must be dissolved in fluids surrounding the cells to stimulate the nerve ending. Sensitivity decreases as the intensity of the odor increases.[11]

The end organs for odor perception are peculiar since they are associated with the only sense in which the primary neuron of the cranial nerve itself is the receptor or is closely identified with the receptor. This perceptive apparatus is bilaterally located high in the nasal vault immediately beneath the cribriform plate of the ethmoid bone. In this region is a specialized yellowish or brownish mucous membrane covering approximately 500 sq. mm.

People have individual distinctive odors. We smell like what we eat; those with a diet high in animal flesh content have a much different odor than vegetarians, and the Eskimo smells like blubber. In general, the young and old are less odorous than the middle-aged. The very lean and the very fat may have

10. Tanyolac, N. N., and Eaton, J. R. Study of odors. J. Am. Pharm. A. (Scient. Ed.) 39:565 Oct. 1950.

11. McCord, C. P., and Witheridge, W. N. Odors: physiology and control. New York, McGraw-Hill Book Co., 1949.

more offensive body odors than those blessed with normal nutrition, brunettes more than blonds, and women more than men.

It is generally believed that special circumstances provoke the secretion of different odorous chemicals; thus the term "platform odor" or "speaker's odor" is given to the odor from a person who is in a state of excitement because of speech making. These odors probably come from the sweat and sebaceous glands of the individual, and the variation from one individual to another depends on the number of these glands. So far as is known, there is no relationship between body odors and halitosis.

IMPORTANCE OF HALITOSIS

Halitosis should be considered important for at least three reasons: (1) it is a social handicap; (2) fear of possessing it can "precipitate a true neurosis," and (3) since the presence of oral odor signifies presence of some abnormality or diseased condition, it may be an important diagnostic aid.

1. Man is forced to live in close contact with others, so that anything about him which is unpleasant may interfere with his acceptance by those about him. It is particularly important that dentists have an unoffensive breath, since the nature of their profession requires that they work in close proximity with others. A student[12] also made this point:

> Man is desirous of being popular as a lover and attractive to the opposite sex and the art of love (as the Caucasian usually expresses it) consists of caresses which begin with oral to oral contact. It is thus important that the breath be 'sweet' and inoffensive to the person receiving and returning these caresses; otherwise, love may be terminated before it has begun.

Suffice it to say that halitosis is a severe social handicap.

2. The recognition that halitosis is common, and that it is unpleasant to a person's associates, has caused many persons to worry about its presence, or the possibility of its presence. Some persons often talk with their faces averted, or with their hands before their mouths, fearing that halitosis may be present. Others chew gum or mints, or use a flavored mouth rinse frequently, because they fear their breath may be offensive and wish to mask the odor. Such fears can reduce a person's confidence in approaching others, and can interfere with his effectiveness in any activity.

3. The presence of halitosis is usually an indication that some abnormal condition exists which should be located and corrected.

DETERMINATION OF HALITOSIS

Determination of the presence of halitosis can best be done by the use of someone's olfactory epithelium. There is no machine or simple chemical test which will reveal the presence of halitosis.

Tanyolac and Eaton[10] have reported a technic for determining odor intensity by studying changes in the surface tension of liquids in the presence of contaminated air. They studied the effects of several standard odors on the surface tension of water, mineral oil and mercury, and noted a change in surface tension in the presence of even minute quantities of odors.

Another technic for determination of volatile substances associated with spoilage of fish products has been reported by Farber.[7] He found that by aspirating a known amount of air through the material to be tested into a standard amount of potassium permanganate, the amount of reduction of the permanganate could be used as an index of the content of volatile material.

Further development of these technics may result in a more accurate method of determining halitosis than is now available.

12. Atkinson, R. A. Unpublished paper.

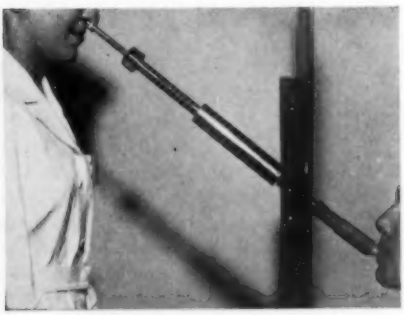

Fig. 2 • Osmoscope in use in manner that hides operator from patient. "Sleeve" to left of small partition can be pulled up to close more and more of the tiny holes in long tube, thus reducing dilution of expired air

Use of an instrument called the osmoscope is sometimes made to aid in determining the intensity of the odor present, but the interpretation of the results with this instrument is subjective. The osmoscope (Fig. 2) was perfected by Fair and Wells in 1934 for the measurement of odors in water and adapted for oral use by Brening, Sulser and Fosdick,[13] and Morris and Read.[3]

Basically, the osmoscope is a long tube with several holes in it which can be opened and closed at will to change the dilution of the odor with air. If an odor can be detected with all holes open, the odor is strong, and is given a number, called a pO number. The osmoscope may be used by increasing the dilution of air until the odor vanishes, or decreasing the dilution until the odor is first detectable. Clean air, blown into the mouth and then into the osmoscope, gives mouth odors only, whereas having the patient exhale air from the lungs combines mouth odors with odors from the lungs, pharynx and so forth.

Sometimes the air to be tested is passed through a trap cooled by liquid nitrogen to condense the volatile odors into a solid mass. Later this mass is warmed to 35°C., and the odor determined by the osmoscope. Obviously the pO reading depends on the sensitivity of the perceiver's sense of smell; if he were to get a bad cold in the middle of an experiment, the experiment would, of course, have to be repeated.

An odor of the order of pO_6 is one which is detectable even though diluted 64 times; pO_5 is detectable though diluted 32 times; pO_4, detectable though diluted 16 times; pO_3, though diluted 8 times; pO_2, though diluted 4 times, and pO_1, though diluted 2 times. Values below pO_3, even if unpleasant, are not considered indicative of halitosis. Since the thresholds of odor perception vary widely from patient to patient, and from day to day, accuracy of determination of odor intensities by the osmoscope is limited.

The types of odors found in the oral cavity are many, and no exact method of classifying them is known. They are usually described according to the reactions and interpretations of the individual doing the testing, as sweet, sour, fetid, "heavy."

CAUSES OF HALITOSIS

Breath odors vary from hour to hour, day to day, and according to age. In the young child the breath normally has a rather sweet, pleasing odor; as the person grows older the breath odors gradually become more definite but not, normally, too unpleasant. The average adult breath is described as "heavy," "pungent," "somewhat sour," and so forth. The change in normal breath might be due to epithelial and food debris, salivary stagnation, periodontal disease, and perhaps metabolic changes in the individual.[13,14]

The breath of most people is unpleasant when they first arise. It is probable

13. Brening, R. H.; Sulser, G. F., and Fosdick, L. S. Determination of halitosis by use of osmoscope and cryoscopic method. J. D. Res. 18:127 April 1939.

14. Massler, M.; Emslie, R. D., and Bolden, T. E. Fetor ex ore. Oral Surg., Oral Med. & Oral Path. 4:110 Jan. 1951.

that the inactivity of the tongue and cheek during sleep allows the oral flora to break down food debris more rapidly than during the day when the constant motion of the tongue, lips and cheek tends to keep the oral cavity clean. The intensity of early morning oral odors also varies with other factors: chronic sinusitis with the ever-present "postnasal drip," sleeping with the mouth open, and so forth.

It is helpful to group oral odors into three groups: (1) those from within the oral cavity; (2) those from the regions immediately adjacent, and (3) those from the lungs. Combinations of these groups occur, of course. Location of the source of the oral odor is sometimes difficult. Comparing the odor of air blown out through the nose with that from the mouth sometimes will help determine whether the malodor is from the oral cavity or whether it is from the nasopharynx or lungs or both

Odors from the Oral Cavity • Lord Philip Chesterfield wrote in his *Letters* to his son:

> A dirty mouth has real ill consequence to the owner; for it infallibly causes the decay, as well as the intolerable pain of the teeth; and it is very offensive, for it will most inevitably stink.

By sniffing material from carious lesions, gingivitis and more serious periodontal disease, debris from food impaction, pericoronitis and putrescent pulps, it can be demonstrated that most oral diseases produce conditions which are odorous and hence can contribute to halitosis. Even saliva held at 37°C. for one hour will show an increased pO of over 1 and after three hours of 3.5. (Everyone has had the experience of using a telephone which has been used by a person whose speech is accompanied by a light spray of saliva, and noted the "halitosis" from the phone.) Berg and Fosdick[15] found that practically all of 17 oral organisms they studied played some role in the putrefaction of salivary proteins. There is no one "halitosis microorganism."

Obviously it is important for the dentist to correct these conditions when they are present; one of the results of correct dental therapy will be an improvement in the quality of the breath of the patient.

Scientifically acceptable data are few, but it is apparent that in a majority of patients with halitosis, correction of oral causes for halitosis will result in a reduction of the breath odors to a point where they are unobjectionable. Morris and Read[3] found that a complete dental prophylaxis in a series of 19 patients reduced the halitosis in 13 to an unobjectionable level. Brushing the teeth resulted in a reduction of pO for two hours; the dentifrice odor lingered a half hour only. Toothbrushing with a flavorless dentifrice will reduce early morning halitosis 66 per cent and general mouth odors 30 per cent, and after brushing, 90 per cent of patients will have only inoffensive mouth odors.[16] Scraping and rinsing the tongue reduced the pO reading for some patients but not for others. Odors from decaying food debris, carious lesions and pathologic pockets in periodontal disease, stagnation and putrefaction of saliva, unclean prosthetic appliances, mouth breathing and smoking are important causes of halitosis.

The type of food chewed is of importance, too, in producing mouth odors. Crohn and Drosd[2] reported that a willing subject chewed strong, garlicky salami thoroughly without swallowing it, and the breath had a strong garlic odor. Within an hour, however, no garlic odor was discernible on the breath. Stallard[17] reported that air sucked through marinated

15. Berg, M., and Fosdick, L. S. Studies in periodontal disease. II. Putrefactive organisms in the mouth. J. D. Res. 25:73 April 1946.

16. Sulser, G. E.; Lesney, T. A., and Fosdick, L. S. Reduction of breath and mouth odors by means of brushing the teeth. J. D. Res. 19:173 April 1940.

17. Stallard, Harvey. Residual food odors of the mouth. J.A.D.A. 14:1689 Sept. 1927.

onion for one hour caused a transitory halitosis.

Odors of Systemic Origin • Tonsillitis, sinusitis and rhinitis can also contribute to halitosis. Prinz[18] called attention to involvements of the nose, sinuses and throat, as causing oral odors.

Gastric ulcers and carcinoma do not in themeselves cause halitosis unless complicated by necrosis or secondary infection.

Garlic or onion juice inserted directly into the small intestine or colon will give a characteristic odor within three hours. If garlic or onions are ingested, the odor will persist for many hours, even days.

Many references in the literature suggest that oral odors can be an aid in the diagnosis of certain systemic disorders. The following odors are supposed to be related to systemic causes:

1. The odor of Limburger cheese—chronic tonsillitis.
2. Sour odor—digestive dysfunction.
3. Fetid breath—acute ulcerative gingivitis, bronchiectasis.
4. Urinous odor—kidney dysfunction and uremia.
5. Stench—gangrene.
6. Acetone—diabetes.
7. Fruity odor—after the use of ether for general anesthesia.
8. Mousy odor—liver dysfunction.
9. Blood odor—intestinal hemorrhage.

A very disagreeable breath results from the high milk fat (Sippy) diet used in instances of gastric ulcers. Constipation does not necessarily contribute to halitosis; laxatives do not improve the quality of the breath.

The ingestion of yellow phosphorus and tellurium metal or compounds will impart a garlic odor to the breath. Some writers say that arsenic, too, will do this, but this is questionable. As regards tellurium, Drill[19] stated:

> Although some tellurium compounds are relatively toxic when injected into animals, there are very few cases of severe poisoning recorded in the literature. Tellurium workers suffer from extremely odoriferous breath.

Exposure of a worker to even slight quantities of tellurium endangers them socially.

The previously mentioned odors are said to be caused by the formation of methyl, or ethyl, compounds of phosphorus or tellurium, which compounds have a pronounced odor and are somewhat volatile.

There is an old belief that during the first part of a woman's menstrual period, her skin excretes a toxin which will wilt flowers worn by her and which will interfere with the proper rising of dough which she has kneaded. It is thought these phenomena may be due to menotoxin.[20]

The value of oral odors in establishing a diagnosis of some systemic disorder has been overrated. Certainly today there are much better methods of establishing diagnoses than by sniffing the patient's breath. Some older diagnosticians, however, use breath odors to aid in diagnosis. It must be recognized that correction of halitosis is often dependent on correction of some systemic condition.

Drunkometer • Sniffing a person's breath to determine whether he has been imbibing alcoholic beverages is unreliable, since the alcohol in expired air has little odor. A small amount of a fragrant beverage yields a transient mouth odor greater than a large quantity of bourbon and water. If a person were to rinse his mouth with whiskey, without swallowing, the odor of the flavoring in the whiskey could persist for more than one hour. The content of alcohol in expired air, however,

18. Prinz, Hermann. Offensive breath, its causes and prevention. D. Cosmos 72:700 July 1930.

19. Drill, V. A. Pharmacology in medicine. New York, McGraw-Hill Book Co., 1954, p. 52-58.

20. Macht, D. I. Concerning the chemical nature of menstrual toxin. Am. J. Obst. & Gyn. 57:251 Feb. 1949.

is a reliable method of assessing the amount of alcohol in the blood stream.

After it leaves the stomach, alcohol is distributed fairly uniformly all through the body. For this reason it is possible to predict the concentration of alcohol in the brain by analyzing various body materials, including blood, saliva, urine and breath. Since the accumulated alcohol is slowly burned, such tests do not show when the drinking was done, or precisely how much alcohol was consumed. They do show the load of body alcohol at the time of the test, and this is just the information needed to tell the person's condition at the time of the test. The degree of intoxication closely parallels the concentration of body alcohol.

An instrument called the Drunkometer, devised by Harger[21] of Indiana University, is widely used by police departments to check on the condition of the suspect. Briefly, the Drunkometer consists of apparatus and chemicals which are contained in a portable case about the size of an overnight bag. To run the test, a fluid composed of water and sulfuric acid, and colored red by potassium permanganate, is placed in a glass-stoppered tube. The driver's breath is then caused to bubble through this red fluid after which it goes to a small gas meter, which measures the volume of breath used in the test.

If the breath contains alcohol, this alcohol is caught in the red fluid, which fades and finally loses all of its red color when it has caught the amount of alcohol necessary to cause the complete change. At this point the passage of breath is stopped, and the volume of breath used is read from the gas meter. Since the same weight of alcohol is always caught, the answer is obtained from the volume of breath used to remove all the red color. Thus, the more drunk the person is, the smaller will be the volume of breath used.

It is then a simple matter to calculate the concentration of alcohol in the person's blood or brain, since 2,000 cubic inches of breath contain practically the same weight of alcohol as 1 cubic inch of blood or brain. If the test requires less than about two thirds of a pint of breath, the driver is certainly under the influence of alcohol. After a driver has imbibed one bottle of beer, the test will require at least a half gallon of breath, and such a person is not considered "under the influence."

No nondrinking person will have a breath which will change the red fluid. This has been shown repeatedly, with both well and sick persons. Onions, garlic and halitosis have no effect on the Drunkometer. At a New York automobile show a few years ago, the Drunkometer test was exhibited by the National Safety Council, and of the 3,050 who took the test, not one person denied the findings.[22] The demonstration has been repeated with the same results. Some people have claimed that the test can be altered with gargling with water or deep breathing, but this is not true.

TREATMENT

Ninety per cent of all odors on the breath originate from local oral conditions, usually decaying food debris, stagnating saliva, minor gingival hemorrhages, and so forth. Treatment for halitosis therefore includes correction of existing oral disorders. A thorough prophylaxis should be given, followed by elimination of food impactions, periodontal disease, carious lesions, putrescent pulps, unclean dentures, and so forth. Mouth breathing should be avoided. Reduction of intake of fatty substances, particularly milk and butter fats, may be of value; a balanced diet is to be preferred in most instances, anyway, so it should be recommended.

Smoking, and drinking of highly flavored beverages, should be reduced.

21. Harger, R. N. Unpublished data.
22. Report of National Safety Council. Public Safety 16:18 Dec. 1939.

Eating of highly spiced foods, flavored with onion or garlic, should be avoided as much as possible.

Careful toothbrushing will also reduce mouth odors in most instances, and often a flavored mouth rinse will help somewhat. Patients must be taught adequate technics for maintaining good oral hygiene, particularly if prosthetic appliances are present. Masking halitosis with a stronger odor, however, is undesirable and ineffective. Use of an oxidizing agent such as hydrogen peroxide or sodium perborate will reduce odors temporarily in some instances, but daily use of such agents is contraindicated.

Certain chlorophyllin compounds have some deodorizing qualities but their use in a dentifrice has been overrated. Hein[23] reported that sodium copper chlorophyllin was effective in reducing odor of stagnating saliva *in vitro* and gave some indication of a similar action *in vivo*. Chewing gum containing the some components reduced the oral odor from garlic and onions. Some chlorophyllin compounds apparently can deodorize certain odors only; the deodorizing qualities seem to be selective.

Some instances of halitosis will require searching by a competent physician for systemic causes. Obviously, correction of the pathologic process causing the odor is necessary to improve the halitosis.

Those who work close to others should train themselves to refrain from breathing directly on their associates. Dentists should discuss problems associated with halitosis freely with their patients, and dentists themselves should insist that they be kept informed about the status of their breath.

Halitosis is a handicap to the social acceptance of persons who have it; those who work in close contact with the public must guard against it constantly.

Hawxhurst,[1] in 1873, warned dentists about their breath:

> Dentists do not perceive their own offensive emanations any more than other men. Shoemakers do not realize the odor of leather about their shops; grooms do not know how their clothes smell; the customer, and not the proprietor, is most alive to the odors about an apothecary shop; and the tobacco eater, enjoying his quid or pipe, is the only one who does not know what a sickening fetor these articles add to his breath. The truth is no one detects the smell he is used to, and by consequence, since each one is accustomed to his own breath, he will regard it as odorless, though its vapors be loaded with a dozen different stenches.
>
> The dentist should never operate unless he knows that his breath is pure. He should keep his spittoon sweet; he should keep his rooms well supplied with oxygen; he should by changes of linen and bathing render his person offenseless; but above all he should exercise a constant watchfulness over his breath.

23. Hein, John. Unpublished thesis, University of Rochester School of Medicine and Dentistry.

Fundamental Principles of Research • We must put still more emphasis on basic research. The great majority of the momentous discoveries of recent years in atomic energy, in aerodynamics, in solid state physics, have had their beginnings in the abstract theorems of the higher mathematicians and the cryptic formulas of the research physicists. *Harlow H. Curtice. Speech, Clara Elizabeth Maternal Health Fund.*

A head positioner for temporomandibular joint roentgenography

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A head positioner for use in roentgenography of the temporomandibular joint was designed by the author and constructed at Walter Reed Army Hospital. Its use makes it possible to take roentgenograms of the condyles of individuals and at the same time maintain the same relation to the roentgen ray source and film. It allows the dentist to make serial roentgenographic examinations of the temporomandibular joint of the same patient over an extended period, and to compare the effect of different dental operations.

The apparatus was based on the fundamental principles of the Broadbent[1] technic for stabilizing the head while making cephalometric roentgenograms. The two external acoustic meati and the bridge of the nose are the areas used for stabilization. Two ear rods and a nasion rest attachment are used. The Broadbent-Bolton cephalometer is a satisfactory base to which an attachment can be added for positioning the head for temporomandibular joint studies, as the platen which supports the lateral and frontal film cassettes and the nasion rest attachment are held in place by the two bolts seen on the under side of the head positioner near the upright part of the cephalometer. The new attachment can be substituted for the platen and bolted in place. The base of the cephalometer and the x-ray tubes are bolted to the floor, thus placing the head positioner and the x-ray source in a fixed relationship to each other.

HEAD POSITIONER

The head positioner is seen in Figure 1. The plastic ear rod at A is fixed and positioned so that the central ray of the x-ray tube passes through it. The ear rod at B is adjustable to the lateral dimensions of each individual's head, and the support for this rod can be moved along the track E. The track has a millimeter scale inscribed on it so that any position of the ear rod can be recorded and duplicated at a later date. The upper half of the ear rod supporting structure can be rotated on the base so that the rod is always pointing directly at the stationary ear rod. The degree of rotation is read on a scale inscribed on the ear rod support base and can be noted for use in making subsequent records.

There are two nasion rest attachments, C and D. The patient is rotated 180 degrees between the making of the roentgenograms of one side and of the other; this is why two nasion rest attachments are needed. Figure 2 shows the position

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1. Broadbent, N. Holly. A new x-ray technique and its application to orthodontia. Angle Orthodont. 1:45, 1931.

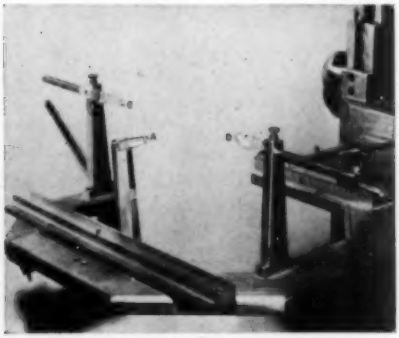

Fig. 1 • Temporomandibular joint head positioner. A: Stationary ear rod. B: Adjustable ear rod. C: Nasion rest attachment used when making roentgenograms of left side. D: Nasion rest attachment used when making roentgenograms of right side. E: Millimeter scale. F: Film cassette channel. G: Supporting base for adjustable ear rod

of the patient when roentgenograms of the right and left temporomandibular joints are being taken. The same x-ray tube is used for the two sides. The nasion rest attachments are at a fixed vertical height and can be adjusted to the anteroposterior dimensions of the patient. The height of the nasion rest attachment is set so that the orbital point on the side for which the roentgenograms are being made is approximately on the same horizontal plane as the porion point.

The head is positioned so that the porionic axis, instead of being parallel to and coinciding with the central ray of the x-ray tube as it is in cephalometric work, is at an angle downward and forward. The porionic axis is at an angulation of 10 degrees downward and 12.5 degrees forward to the central ray. With the head in this position, the central ray enters the head a little above and behind the ear and leaves at the external acoustic meatus on the side being filmed. From determinations with the head in this position it has been found that the central ray of the x-ray tube is nearly parallel to the long axis of the condyle. Although the angulation of the condyle will vary in each individual, and will even vary between the right and left sides of the same individual, it is felt that it is better to position each person's head at the same angulation—the average found for the long axis of the condyles. If determinations were made for the angulations of condyles for each temporomandibular joint, it would be necessary to change the angulation of the person's head only a few degrees. This change of angulation

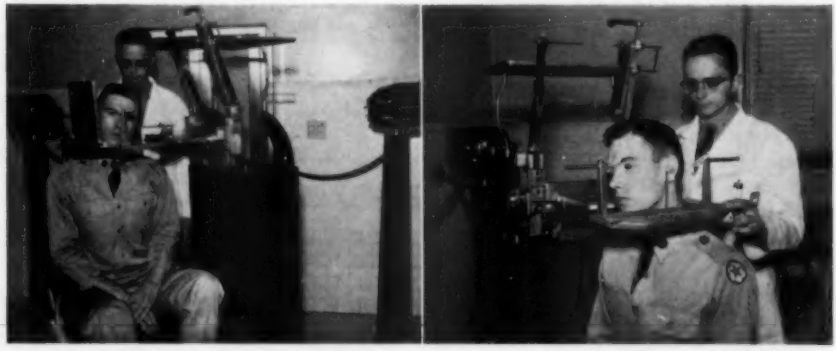

Fig. 2 • Left: Individual positioned for filming right temporomandibular joint. Right: Positioned for filming left temporomandibular joint

would have relatively little effect on the resulting roentgenogram.

The film for the temporomandibular joint roentgenograms is at right angles to the central ray of the x-ray tube and is 68.5 inches from the tube target. A distance of this magnitude from the tube reduces enlargement to a minimum and makes it possible to interpret structures, such as the orbitale, and to use them as reference points. This is impossible with most of the other technics used for temporomandibular joint roentgenography because of the enlargement and distortion caused by the closeness of the x-ray tube to the film.

Tracings were made of the roentgenograms (Fig. 3) for most of the diagnostic and temporomandibular joint studies. On these tracings it was possible to trace the condyle, the glenoid fossa, the posterior border and angle of the ramus, the superior outline of the sphenoid bone, and the orbit. On the side being filmed, a metal ring was imbedded on the stationary ear post (Fig 4). The most superior point on this ring defines porion. The most inferior point of the orbit on the side being filmed is the orbital point. A line is drawn between porion and orbitale. This is the reference line used in the measurements and angulations in the assessment of the temporomandibular joint roentgenograms. Lines, parallel to the porion-orbital line, are drawn on the tracing (Fig. 3). One of these is at the most superior point of the inner surface of the glenoid fossa, one at the most superior point on the condyle, and one from the lowest point of the articular eminence. By measuring the distances between these parallel lines in the different roentgenograms, the following measurements can be recorded: (1) the height of the fossa, (2) the distance from the condyle to the height of the fossa and (3) the relationship of the fossa height to the porion-orbital line. The anteroposterior movements of the condyle are measured from the center

Fig. 3 • Tracing of temporomandibular joint roentgenogram showing various measurements made in assessment. A: Fossa height. B: Porion to fossa height. C: Top of condyle to fossa height. D: Porion to center of condyle. E: Angulation of ramus to porion-orbital line. F: Angulation of slope of articular eminence to porion-orbital line. O: Orbitale. P: Porion

of a circle inscribed in the condyle to a line perpendicular to the porion-orbital line from the porion point (Fig. 3). Two angulations are recorded: (1) the ramus to the porion-orbital line measured from a line drawn tangent to the posterior border of the ramus, and (2) the slope of the articular eminence to the porion-orbital line measured from a

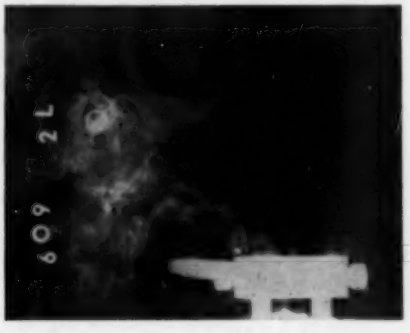

Fig. 4 • Temporomandibular joint roentgenogram made with patient's head positioned in head positioner

line tangent to the straightest portion of the slope of the articular eminence.

Tracings of roentgenograms of various jaw positions, or tracings of serial roentgenograms of the same joint can be superimposed on each other and direct comparisons of the relation of the condyle to the glenoid fossa can be made. The superpositioning of these tracings is made possible through the utilization of anatomic points and structures outside of the joint which can be used for orientation. The anatomic points and structures used are porion, the superior surface of the sphenoid and the orbit. Direct comparison of the relation of the condyle to the glenoid fossa is extremely valuable in following the changes in the temporomandibular joint articulation brought about by different dental procedures. Comparison of the relative position of the condyle to the glenoid fossa in different jaw positions, centric occlusion and physiologic rest position is also possible.

RESULTS

The three main objectives that prompted the designing and construction of the temporomandibular joint head positioner are being attained. Specifically:

1. Studies are being made to determine if there is a consistent uniformity in the relationship of the condyle and the glenoid fossa. These studies are being done by age groups on white men. In the 20 year age group there is a fairly high degree of uniformity in the relative position of the condyle to the fossa. This study is being carried out in other age groups, and one will also be conducted on edentulous individuals.

2. The observations made in normal individuals of the relative position of the condyle to the glenoid fossa are being utilized as a diagnostic yardstick for interpretation of roentgenograms of individuals complaining of temporomandibular joint discomfort.

3. Serial standardized temporomandibular joint roentgenograms of an individual are being used as before, during and after treatment records. The dental operator can see the effects of dental treatment on the temporomandibular joint.

SUMMARY

A head positioning attachment for making temporomandibular joint roentgenograms is being utilized at the Walter Reed Army Hospital Dental Clinic. This attachment, designed by the author, accurately positions each individual's head in a precise relation to the x-ray source and the film. The target-film distance is 68.5 inches, which eliminates distortion and enlargement and permits the use of anatomic structures and anthropometric points outside the joint for reference points in measurements. The roentgenographic results obtained when this head positioner is used are of value in studying the normal articulations of the temporomandibular joint, in diagnosing temporomandibular joint disturbances, and in studying the joint of the same individual during extended periods of treatment.

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Investigation • When we investigate clinically some disease, or some manifestation of it, we may be seriously handicapped by circumstances; but we are possessed of the certain knowledge that what we study is precisely what we set out to study. *Lewis.*

Ideal versus adequate dental occlusion

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The occlusion of the teeth has been said to be the basis for the science of dentistry. In spite of this, the subject of occlusion has been much talked about, but little has been done about it until recently. This paradoxical situation can be traced to the dental curriculum.

In the average dental school the student's first contact with the subject of occlusion comes at the time that he articulates the teeth that he has carved so laboriously. Emphasis is placed on the ideal or normal interdigitation of the teeth.

His next contact with the subject of occlusion comes in the complete denture department where the student is taught the articulation of artificial teeth and is given a fixed mechanical concept of functional occlusion. Again, the concept that is presented to the student is the ideal situation. In many schools this has been the extent of the formal course work. With this meager background the neophyte practitioner is expected to be able to analyze critically his patients' occlusions and to institute the correct treatment for the occlusal disharmonies which are detected.

In recent years the dental schools have been made aware of this deficiency in the student's background and have taken steps to remedy the situation. Also, an increased emphasis has been placed on this subject by dental societies throughout the nation. This awakening of interest has been brought about primarily by two groups, the periodontists and the occlusal reconstructionists. Through panel discussions at dental meetings, a unified concept of occlusion in its broadest aspect gradually is being achieved.

The purpose of this paper is to define the characteristics of the various types of occlusion and to point out the variations that exist in the general population. Occlusion implies more than just how the teeth meet when the jaws are closed. Such a concept would be a static one and would be useless when applied to a living being. In order to be useful, a concept of occlusion must be dynamic or functional. Anderson[1] has aptly said:

> Static occlusion may be compared to the possession of money, nice to have but of little real value unless put to use to produce. Dynamic occlusion is to be compared to the possession of money which, put to use, earns its way and in so doing is of increasing value to the owner.

In the evaluation of the occlusion of individual patients, the dentist must study the relations of the teeth in excursive movements of the jaws. Only through such an evaluation can malfunctional relationships of the teeth be diagnosed and a rational plan of treatment outlined.

Beyron[2] has used the term "functional

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1. Anderson, George M. Practical orthodontics, ed. 8. St. Louis, C. V. Mosby Co., 1955, p. 96.

2. Beyron, Henry L. Characteristics of functionally optimal occlusion and principles of occlusal rehabilitation. J.A.D.A. 48:648 June 1954.

optimal occlusion" to define the general aim of dental treatment. He explains this term as

> . . . occlusion that is in functional harmony with the whole masticatory system, comprising the soft tissues, the facial skeletal, the muscles and the temporomandibular joint—occlusion that insures efficient functioning without placing undue strain on the integral structures.

This aim should be the goal of every dentist for all of his patients; however, it is not always possible to achieve it because of the infinite variations in occlusal relationships. Beyron's definition implies an ideal condition that few individuals possess or have the potentialities of attaining. Therefore, a compromise must be sought, and the dentist must make the most of the basic component parts and relations that make up the patient's occlusion. When these component parts are brought into the best possible balance, the results are not always optimal but they may be termed adequate.

In order to obtain adequate functional occlusion for his patient, the dentist must be intimately acquainted with the variations that exist in occlusions so that he may carry out a rational plan of treatment. He must know not only the variations but he must also have a working knowledge of the forces of occlusion.[3]

IDEAL OCCLUSION

Earlier it was pointed out that occlusion has always been taught from the standpoint of the ideal relationship of the teeth and jaws and associated structures. How often is this ideal relationship observed by the dentist in his everyday practice? In a recent survey[4] of over 800 junior and senior Seattle high school students, it was found that only 2 per cent possessed what might be termed "ideal" occlusion. The age range for this group was 15 to 18 years, so from a dental standpoint they were adults. Twenty-seven per cent of the group are classified as having "normal occlusion," or as those for whom orthodontic treatment was not necessary.

This latter group possessed some evidence of malocclusion such as a slight rotation, or lapped or open contact, but it was felt that orthodontic treatment was not justified. Thus, 29 per cent of the population were classified as "normal," whereas, 71 per cent definitely had malocclusions requiring orthodontic treatment. The observations made in this survey agree closely with those made in other surveys. The dental student has been taught only a normal concept of occlusion, and yet 71 per cent of the persons on whom he practices do not have the occlusal relationships that he has been led to expect. It is obvious that only a small percentage of this group of 71 per cent will receive the benefits of orthodontic therapy. Those individuals with malocclusions that do not receive orthodontic correction often can be provided with an adequate functional occlusion through dental service.

It might be well to define adequate dental occlusion as it is used in this paper. The reader might assume that any dentition in malocclusion, as defined by the orthodontist, would not have adequate occlusion. This is not necessarily so, as many teeth in malocclusion possess good functional balance.

It is also possible for a person to have the attributes of "normal occlusion" when the jaws are in static relationship, but to have a malocclusion when viewed in the functioning relationships. Malocclusion, therefore, should be distinguished from malfunction. If an individual has a good, functional, balanced occlusion, regardless of the arrangement

3. Brodie, Allan G. Biological aspects of orthodontia. In Dental science and dental art, Gordon, S. M. Philadelphia, Lea & Febiger, 1938, chap. V.

4. Blake, Samuel R. A study of the incidence of malocclusion and facial characteristics in Seattle high school students, aged 15 to 20 years. Master of Science thesis, School of Dentistry, University of Washington, 1954.

of the teeth, he can be considered to have an adequate dental occlusion. It may still leave much to be desired from an orthodontic viewpoint; however, if orthodontic procedures are not possible or practical, the dentist's responsibility is to provide at least a balanced functional occlusion.

CHARACTERISTICS OF MALOCCLUSION

The dental features of malocclusion can be described by three different characteristics which may be present singly or in combination. These characteristics are as follows: (1) the presence of an anteroposterior discrepancy in the relations between the base of the maxilla and that of the mandible; (this condition is characterized by either a receding mandible or a prognathic one); (2) the presence of crowded teeth or spacing of the teeth within one or both of the dental arches, or of cross-bite relationship of one or more teeth, and (3) the presence of excessive overbite or overjet of the anterior teeth.

In evaluating the problem facing the dentist it might be well to review briefly the incidence of these various conditions within the 71 per cent of persons who possess malocclusions. The Angle classification of malocclusion will be used as a basis for this discussion. This classification is based on the relative anteroposterior relationship of the molars and is roughly correlated with the facial type, that is, retrognathic, mesognathic or prognathic.

Seventy-six per cent of the group with malocclusions had Class 1 malocclusions. This group had the same molar relationship as that of the group with normal occlusions, and generally speaking did not have an anteroposterior discrepancy in the relation of the maxilla and mandible. This characteristic of malocclusion, therefore, is not a factor in this group.

Twenty-three per cent of the group with malocclusions fell within the Class II malocclusion classification in which the maxilla and mandible are locked distally and there is an increase in the incisal overbite or overjet of the anterior teeth. A disproportion in the anteroposterior relationship of the maxilla and mandible is an important etiologic factor in this class of malocclusion. In other words, the anterior portion of the mandible is too far posterior to the anterior maxillary dentition to permit a normal tooth relation to develop.

Less than 1 per cent of the group with malocclusions fell in the Class III classification in which the individual possesses a prognathic mandible. The most recognizable feature of a Class III malocclusion is a cross-bite relation of the anterior teeth and the maxillary molars which are distal to the mandibular molars.

Only the Class II and Class III malocclusions have an anteroposterior discrepancy in the relations between the maxilla and the mandible. This characteristic, therefore, will be a problem in only about 24 per cent of the group with malocclusions, or less than 17 per cent of the total population. This characteristic of malocclusion is basically hereditary.

The second characteristic, the presence of crowding, inadequate space or cross-bite relationship of teeth within either or both dental arches, is common to all three classifications of malocclusion. These conditions are rather equally divided among the various classes of malocclusion.

Roughly, 45 per cent of patients with malocclusion have sufficient space for the accommodation of all of the teeth despite their malocclusion. Forty-one per cent of the group with malocclusions shows evidence of crowding within the dental arches. Only 14 per cent exhibits spacing or excessive room within the dental arches. Twenty-seven per cent of all patients with malocclusion have cross-bite to some degree. The major

problem within this characteristic is insufficient room to accommodate all the teeth within the dental arches. Forty-one per cent of the total malocclusion group falls in this category. This condition is primarily due to heredity.

It must be recognized, however, that in the developing dentition, premature loss of deciduous teeth will produce this effect. Another cause is man-made. Zealous dentists who overcontour individual dental restorations in a desire for a tight contact with the adjacent tooth, often are guilty of causing rotation and crowding of the teeth. This is especially true if a great number of proximal restorations are placed in the same mouth.

The third characteristic, the presence of excessive overbite or overjet of the anterior teeth, also may be found in all classes of malocclusion. Excessive overbite was observed in about 17 per cent of the group with Class I malocclusions. The incidence of this condition more than doubles in the Class II and Class III malocclusion groups, so that the incisor relationship becomes a major problem. Because of the anteroposterior discrepancy of the denture bases in these two classes of malocclusion, it is impossible for the maxillary and mandibular incisors to be in normal relation. A deepening of the overbite relationship of these teeth becomes a perplexing situation to the dentist. Protrusion of the maxillary incisors parallels the deepening of the overbite in the patients with retruded mandibles.

EFFECT OF MALOCCLUSION ON THE PERIODONTIUM

What effect does malocclusion have on the periodontium and the life span of the natural dentition? The first characteristic of certain types of malocclusion is an anteroposterior discrepancy in the relation between the maxilla and the mandible. This condition in itself has no effect on the periodontium other than to produce the undesirable tooth relations just discussed.

The second and most prevalent of the characteristics is the crowding of teeth within either or both of the dental arches. This condition increases the food retention regions within the mouth and makes oral hygiene difficult. In caries-prone individuals, it will also increase their susceptibility. Because of the crowding, there will not be as much interproximal bone and, therefore, there will be less tissue for the individual teeth. This will lower the resistance to periodontal disease as well as allow the disease to progress more rapidly.

The third characteristic, excessive overbite or overjet of the anterior teeth, may affect the periodontium in several ways. Excessive overjet of the incisors is directly related to the discrepancy in the anteroposterior relation of the maxilla and mandible. The greater the discrepancy, the greater the amount of incisal overjet.

Excessive overjet in itself presents a problem primarily of facial and dental esthetics. The factor of excessive incisal overbite is directly related to the degree of incisal overjet. Generally, incisors will erupt continually until they meet their antagonists or some other obstruction. In the person with receding chin or Class II malocclusion, the mandibular incisors often continue eruption until they impinge on the gingival tissue lingual to the maxillary incisors. This condition usually produces chronic inflammation of the soft tissue lingual to the maxillary incisors, with resulting bone loss and increased mobility and protrusion of the maxillary incisors often accompanied by pain.

Less frequently, there is a pronounced incisal overbite without excessive overjet of the maxillary incisors. In these patients the excessive overbite has a traumatic effect on the supporting structures of the maxillary incisors, and prevents the individual from executing

normal excursive movements of the jaws during mastication.

TREATMENT

It was pointed out earlier in this paper that only about 2 per cent of the population possesses ideal occlusion. An additional 27 per cent can be classified as having normal occlusion. This leaves 71 per cent of the population with malocclusion and the potential of inadequate functional occlusion. Only a small percentage of this group receives the benefits of orthodontic treatment, and so it behooves the dental profession to attempt to provide these individuals with at least an adequate functional occlusion. If the dentist would institute space maintenance in the developing dentition where indicated and would not overcontour or undercontour the proximal surfaces of his restorations, he would be able to prevent the development of a malfunctioning dentition in some of his patients.

In those instances where malfunctioning relationships develop, they can be corrected by utilizing several different methods either singly or in combination. Such occlusal disharmonies may require rehabilitation by fixed restorations, removable splints, judicious extraction of selected teeth or occlusal equilibration.

The ideal treatment for any malocclusion is, of course, orthodontic therapy. For those patients that will not receive orthodontic treatment, the general practitioner can provide many with treatment that will insure at least an adequate functional occlusion.

Crowding of the dentition frequently may be corrected by the judicious extraction of a tooth or teeth. The most common condition in which this treatment is indicated is crowding of the mandibular incisor segment. If the patient is not to receive complete orthodontic treatment, the extraction of a mandibular incisor will permit a favorable realignment[5] of the lower incisors with the minimum of help. This procedure will prevent the sequelae of crowding.

Excessive overbite and overjet can be treated best with the Hawley bite plane. It must be remembered, however, that the primary cause of the incisal overbite or overjet is the anteroposterior discrepancy of the maxilla and the mandible. The use of the Hawley bite plane for the correction of excessive overbite or overjet of the incisors is only palliative; it will not correct the original cause.

The use of the bite plane will alleviate the impingement of mandibular incisors on the lingual tissue of the upper incisors and will permit the eruption of the posterior teeth so that functional occlusion is re-established. When the bite plane is removed, however, the lower incisors will continue to erupt until they again impinge on the tissue lingual to the maxillary incisors. For this reason, when this appliance is used to correct excessive overbite relationship of the incisors without full orthodontic treatment, the patient must continue to wear the bite plane at least at night for the rest of his life.

It is possible through restorative dentistry to discard the bite plane provided the restoration or removable splint has a ledge with which the mandibular incisors may occlude. Where maxillary incisors are protrusive and pronounced overjet of the anterior teeth and spacing are present, it is often possible to retract these teeth with the anterior loop on the Hawley bite plane. Again, the result achieved is not permanent and requires at least the nightly use of the appliance for the rest of the patient's life.

The basic anteroposterior discrepancy of the maxilla and mandible can only be corrected through full orthodontic

5. Hirschfeld, Leonard, and Jay, James. Minor tooth movement by means of rubber-dam elastics. J.A.D.A. 50:282 March 1955.

therapy. In a small percentage of patients, additional help is required from the plastic surgeon. There is nothing that the general practitioner can do in such instances unless he resorts to major orthodontic procedures.

After the procedures described have been completed it is the dentist's responsibility to achieve a balanced functional occlusion through restorative dentistry and occlusal equilibration. The principles to be followed in planning restorative procedures and selective equilibration have been outlined by Beyron.[2] Briefly, they are as follows:

1. The occlusal stress should coincide as closely as possible with the direction of the long axis of the tooth.

2. The functional stress should be distributed over as many teeth as is possible both in centric and eccentric positions of the jaws.

3. The patient should be able to close his jaws in the centric relationship without interference.

4. There should be sufficient interocclusal clearance between the jaws when the mandible is in rest position.

5. There should be free gliding movements without interference during mastication.

The application of these principles to the individual patient has been described by Schuyler,[6] Beyron[2] and others.

If the dentist has a working knowledge of the forces of occlusion, he is better able to analyze the drift tendencies of teeth and to plan his treatment procedures so as to prevent undesirable migration of teeth through occlusal forces.

SUMMARY AND CONCLUSION

A large segment of the population does not have adequate functional occlusion. The correction of this deficiency should be the goal of every dentist.

Through a combination of the working knowledge of the orthodontist, periodontist and occlusal reconstructionist, the scope of dentistry is advancing rapidly. It behooves every dentist to apply the newer concepts and develop his skills so that an adequate functional occlusion may be achieved for all patients.

6. Schuyler, Clyde H. Correction of occlusal disharmony of the natural dentition. New York D.J. 13:445 Oct. 1947.

The Engines of Persuasion • The *Saturday Review* has a continuing concern for the communications pattern in the United States, through which the public's attitudes, opinions, ideas, values, tastes, and actions are so decisively influenced. SR, therefore, has also observed with profound interest the public-service philosophy and informational policies of U.S. business leaders as they have responded through idea advertising to the task of communicating with the American people in our economic democracy.

Advertising, as we know, is a powerful force for the sale of products and services. But it is also a vast engine of persuasion in the presentation of opinions and ideas through public relations or public-interest messages. *William D. Patterson. Saturday Review, April 20, 1957, p. 46.*

Preliminary report on the reaction of the dental pulp to cavity preparation using an ultrasonic device

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At this writing, no publication dealing with the histopathologic reaction of the pulp of the human tooth to the ultrasonic device used (Cavitron) has appeared in the literature. Before proceeding with more extensive clinical and laboratory investigations into the use of this device, it was deemed advisable to conduct the following preliminary study.

Eight sound bicuspid teeth of three girls, 12, 14 and 18 years of age, were to be extracted for orthodontic purposes. In all but one tooth, a buccogingival cavity was prepared either by the ultrasonic device or by standard bur technic. The cutting was performed under a continuous stream of water. The cavities were dried and filled with baseplate gutta-percha.[1] After the teeth had been prepared, they were extracted under local anesthesia at varying times—6 days, 12 days, 6 weeks and 9 weeks. No symptoms developed in any instance.

Immediately after extraction each tooth was ground down under water on the mesial and distal surfaces, well into the dentin, to facilitate the entry of the Formalin fixative into the pulp. After fixation the teeth were decalcified, embedded in paraffin, sectioned, and several sections of each tooth were stained with hematoxylin and eosin.

Figure 1, left, illustrates a cavity prepared with a bur. The relatively square angle, the step in the floor and the depth of the preparation are evident. Figure 1, right, shows a preparation cut by the ultrasonic vibration instrument. The unevenness of the floor and rounded angles are apparent. With more experience with the device, the operator might improve the cavity outline. The relative depth of the two cavities is comparable.

MICROSCOPIC FINDINGS IN PULP

The reaction of the pulp is described according to the period between cavity preparation and extraction.

Untreated Tooth • No cavity was cut in the upper left second bicuspid of a 12 year old girl in order that the undisturbed pulp could be studied. The pulp was vital and showed the normal histologic structures. Figure 2 shows the regular row of odontoblasts beneath the thin zone of lighter predentin. The cell-free zone

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†Associate professor of dentistry, division of operative dentistry, University of Minnesota School of Dentistry.

1. James, Verda E.; Schour, Isaac, and Spence, J. M. Response of human pulp to gutta-percha and cavity preparation. J.A.D.A. 49:639 Dec. 1954.

Fig. 1 • Left: Cavity cut with bur. Square angle, smooth floor and distance from pulp are evident

Right: Ultrasonic cavity preparation, to be compared with Figure 1, left

of Weil is immediately beneath the odontoblasts. The vessels, nerve fibers, and connective tissue stroma of the pulp are normal.

Six Days • The lower left first bicuspid of an 18 year old girl was prepared with a bur. The dentin and predentin are normal (Fig. 3). The row of odontoblasts has been disrupted by hyperemia and hemorrhage, and the zone of Weil is not apparent. There is a slight infiltration of neutrophils and lymphocytes in the immediate area of the pulp adjacent to the cut dentinal tubules. The rest of the pulp was unaffected.

A cavity in an upper left first bicuspid of an 18 year old girl was prepared with the ultrasonic device. The findings (Fig. 4) are comparable to those of the bur preparation just described. The odontoblasts have been disturbed by areas of hyperemia and hemorrhage. A very mild infiltration of leukocytes in the affected area is apparent. The major portion of the pulp was unaffected.

Twelve Days • A cavity in a lower right second bicuspid of a 12 year old girl was prepared with the ultrasonic device. No bur-cut tooth was used as a control for this period. The effect of the preparation at this stage is minimal (Fig. 5). The odontoblasts are rearranged in an orderly row beneath the predentin, and the cell-free zone of Weil is apparent again. There appears to be very slight evidence of inflammation in the form of a few lymphocytes and plasma cells. The balance of the pulp tissue of the tooth was unaffected.

Six Weeks • An upper right first bicuspid was prepared with a bur and an upper left first bicuspid with the ultrasonic device. Both teeth were from a 14 year old girl. The findings for both teeth are comparable. A very slight residual chronic inflammatory reaction, and the beginnings of "secondary," "irregular" or "reparative" dentin formation is apparent. Figure 6 illustrates a higher magnification of the edge of the affected area, showing the relationship of the re-established odontoblasts to the thickening layer of reparative dentin to the reader's left. The major portion of the pulp was unaffected.

Nine Weeks • A lower left first bicuspid was prepared with a bur, and a lower right first bicuspid with the ultrasonic device. Both teeth were from a 14 year old girl. Again the findings for both teeth were comparable.

The presence of a "calciotraumatic line"[1,2] is illustrated in Figure 7 (and, to a lesser degree, in Figure 6). Reading down from the top of the photomicrograph, the first ragged dark line apparently represents an interruption in the normal apposition (or calcification) of dentin being formed at the time of the operation nine weeks before. This line, and the thickened reparative dentin beneath it, were localized to the affected area beneath the preparation. The remainder of the pulp in both teeth was normal.

DISCUSSION

After investigation of the pulps of 38 human teeth treated in various ways, James, Schour and Spence[1] stated:

> The pulpal response was essentially the same for preparations by the bur technics and the airbrasive technic and could be classified as in a defensive and reparative phase.

Within the limitations of this study, it is felt that the same is true of the pulpal response to the ultrasonic cutting device employed. Our findings agree with and complement those of Healey, Patterson and Van Huysen,[3] who studied seven teeth prepared by the same ultrasonic tool. The teeth were extracted from three weeks to two months after preparation.

Hansen and Nielsen[4] reported that in the continuously erupting incisors of guinea pigs the odontogenic organ at the base or "apical" end of the incisor was injured and both amelogenesis and dentinogenesis were affected by an ultrasonic device used for preparing cavities in these teeth.

There is a need for further study of the periodontal tissues of teeth which have been cut by the ultrasonic method. From the studies of Healey and co-workers[3] and the one reported here, it would seem that no severe damage to the particular periapical tissues occurred in the time periods involved; otherwise the pulps studied would have shown some ill effects. No unusual influence on the formation of

2. Irving, J. T., and Weinmann, J. P. Experimental studies in calcification. VI. Response of dentin of the rat incisor to injections of strontium. J. D. Res. 27:669 Dec. 1948.

3. Healey, H. J.; Patterson, S. S., and Van Huysen, G. Pulp reaction to ultrasonic cavity preparation; preliminary report. U. S. Armed Forces M. J. 7:685 May 1956.

4. Hansen, L. S., and Nielsen, A. G. Comparison of the tissue response to rotary and ultrasonic cutting procedures. (Abst.) J. D. Res. 34:693 Oct. 1955.

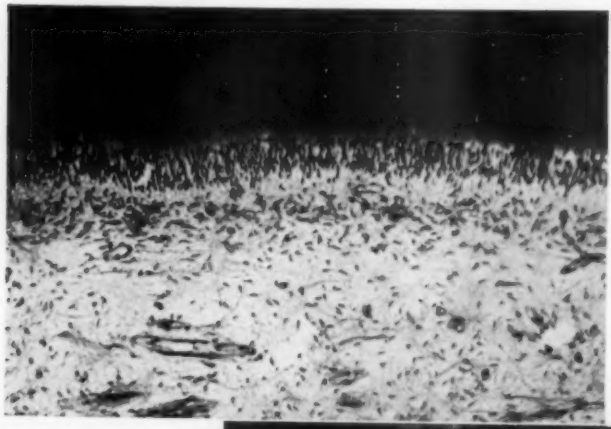

Fig. 2 • Section of pulp of normal tooth

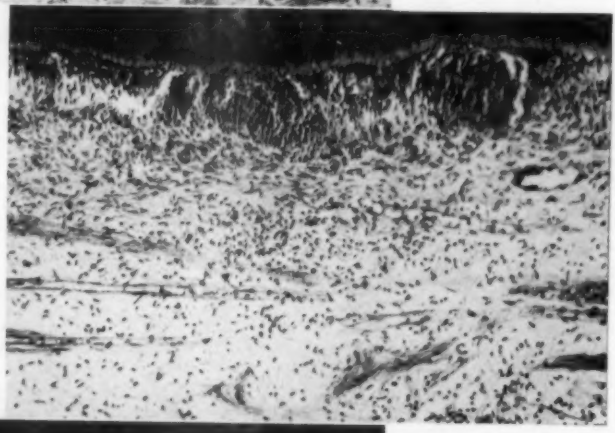

Fig. 3 • Injured area of pulp beneath bur cavity six days after preparation

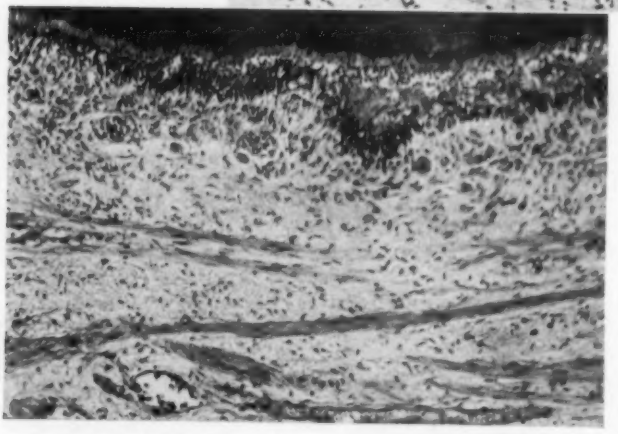

Fig. 4 • Injured area beneath ultrasonic cavity six days after preparation

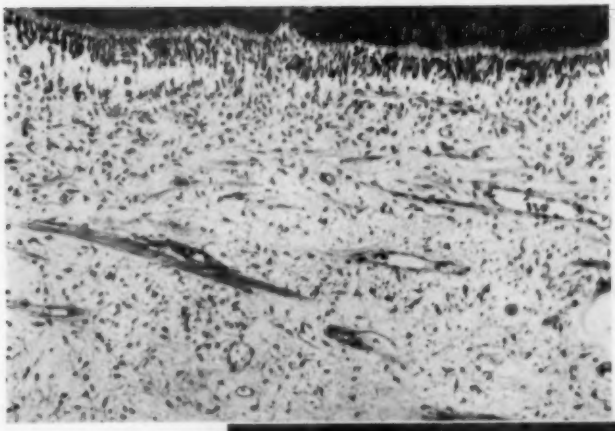

Fig. 5 • Area beneath ultrasonic cavity, 12 days after preparation, recovering

Fig. 6 • Reparative ("secondary") dentin beneath bur cavity, six weeks after preparation

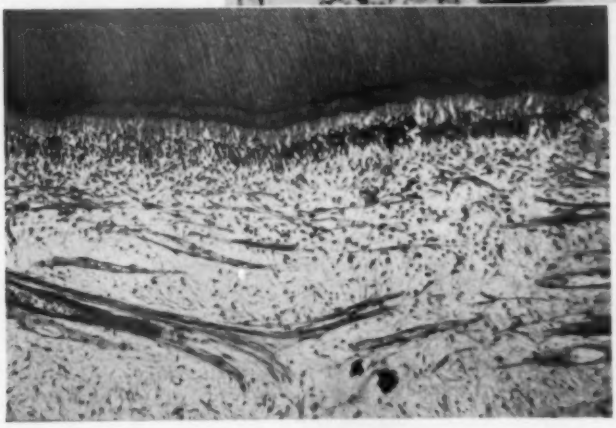

Fig. 7 • Calciotraumatic line and reparative dentin beneath bur cavity, nine weeks after preparation

secondary dentin or cementum was noticed.

SUMMARY

A limited number of sound teeth from young patients were cut by conventional methods, and comparable teeth were cut by an ultrasonic cutting device. The cavities were filled with gutta-percha and the teeth were extracted 6 days, 12 days, 6 weeks and 9 weeks after preparation. The microscopic findings within the pulp revealed no difference in the tissue response to the cavity preparations with the two forms of cutting devices.

Diagnostic roentgenographic interpretation

Henry Cline Fixott, Jr., D.M.D., Portland, Ore.

The title of this paper might lead a reader to believe that complete roentgenographic interpretation is equal to diagnosis. Nothing is more erroneous. In order to make a thorough diagnosis, all the facilities available must be used. To begin with, a dentist must have a good medical as well as dental history of a patient. This would include a general check of his physical condition, his appearance, his general physical characteristics such as pallor, the appearance of his eyes and of the mucosa.

Second, after this general history has been taken and the patient's general appearance noted, a preliminary set of films should be exposed, which, if the patient has teeth, should always include bitewing films. These bitewing films are primarily for the purpose of discovering caries; however, they had better be taken on a standard size film in order to show the crest of the ridge in the interdental spaces as clearly as possible. This is necessary because, with the average technic, an operator exposing dental films will close the interdental spaces by distorting the crest of the ridge so that it shows the crest on the lingual aspect as being more apical, which closes the interdental spaces vertically as well as horizontally. Actually, from the periodontal standpoint, it would be preferable to make exposures with the film as nearly parallel to the long axis of the tooth as possible and the ray at right angles to the film, thus giving the sharpest possible view of the crest of the ridge between all teeth.

While the films are being developed, the usual method for examination—that is, the mouth mirror-explorer examination—can be carried on satisfactorily, charting the caries, and noting the condition of the gingival tissue and the mucosa. After the films are developed, they should be inspected to determine whether they are satisfactory, and preliminary consideration of the possibility of need for retaking the views or for additional films should be considered.

In exposing a good set of films, a dentist should always try his utmost to show the area at least 2 mm. beyond the apexes of all the roots and to show the tuberosities. Figure 1, above left, is an upper bicuspid-molar exposure that apparently was meant to be a molar one. The area

beyond the apex of the distobuccal and lingual roots does not show, nor does the tuberosity. Because of the radiopacity in the posterosuperior area, an additional film (Fig. 1, above right) was exposed which revealed an unerupted impacted third molar.

In making an examination, the lower third molar area is often neglected. When exposures are made, the operator should be certain that the films are far enough back to show everything necessary in the third molar region. In Figure 1, below left, a lower molar view, all of the molars are shown. Many dentists would be satisfied with such an exposure and would remove the partially erupted third molar with this as the only exposure. However, in another view (Fig. 1, below right) a follicular cyst extending to the posteroinferior border of the molar was revealed. A biopsy specimen should be taken in such instances to ascertain the type of cyst. In addition, if such a condition is discovered, biopsy specimens should be taken of any questionable tissues visible in the oral cavity.

The preceding examination should have taken most of the first hour with the patient. When the patient comes for the next appointment, the dentist should have read the films, compared them with what he has observed in the visual examination and be prepared to reexamine the mouth using every facility at hand.

The dentist, on making the second examination, should take into consideration the possibilities of teeth that are periapically involved, thickened periodontal membrane, pocket formation and the like, always keeping in mind what he has learned from the first films. He should use a good method for testing teeth, one that is best in his hands. A good method that is reasonably quick but not quite as accurate as an electrical pulp tester is an ethyl chloride spray. When the spray is used, the teeth are isolated, either with a rubber dam (Fig. 2, left) and spraying the ethyl chloride on the tooth until a frost is formed, or by using celluloid strips to separate the teeth.

Another method of controlling the ethyl chloride spray is through placing a cotton roll next to the tooth distal to that being tested so that the ethyl chloride will not reach the distal tooth, but a frost will be formed on the tooth being tested (Fig. 2, right).

With the electrical test, if the condition is critical, or if there are large fillings in

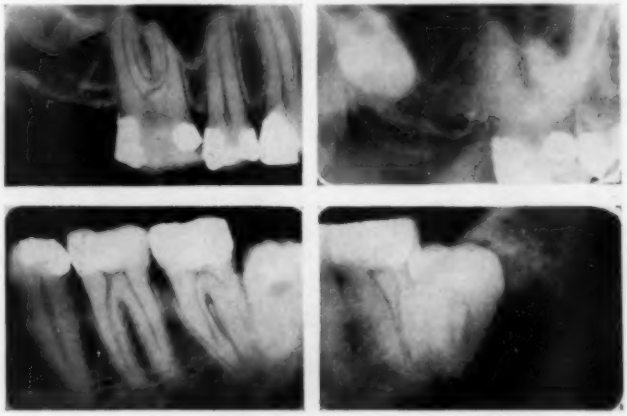

Fig. 1 • Left: Upper bicuspid-molar exposure which was intended as molar view. Right: Additional view showing unerupted impacted third molar

Left: View of lower third molar region. Right: Another view of same region showing follicular cyst

the tooth and the possibility of conductivity must be cut to a minimum, the tooth must be dried properly and isolated with a rubber dam (Fig. 3, left). Cotton rolls may also be used if the teeth have been dried thoroughly first with cotton rolls and air syringe and the teeth isolated by means of celluloid strips (Fig. 3, right).

Other diagnostic aids that should be considered at this time are the additional films necessary because of unusual shadows seen in the original films as mounted. When there are areas of considerable doubt, additional films are enlightening (Fig. 1).

BITEWING FILMS IN DIAGNOSIS OF PERIODONTAL CONDITIONS

Earlier it was suggested that the bitewing film could be used advantageously in the interpretation of the interseptal spaces from a periodontal standpoint. The standard size film is recommended unless there is advanced alveolar destruction. If properly exposed, it will show the crest of the maxillary and mandibular ridges sharply since the ray is as nearly parallel to these ridges as possible. Figure 4 illustrates this statement. These views are typical of many received for interpretation at the Dental School of the University of Oregon.

The upper molars and bicuspids are distorted, the interdental spaces on the bicuspid film closed and those of the molars nearly so. The lower molar and bicuspid exposures are not as bad, but there is room for improvement in that the third molar root is at the edge of the film and slight distortion of the bicuspids can be seen. The crest of both the maxillary and mandibular ridges are consider-

Fig. 2 • Left: Spraying with ethyl chloride spray; area isolated with rubber dam. Right: Ethyl chloride spray used with cotton roll isolation

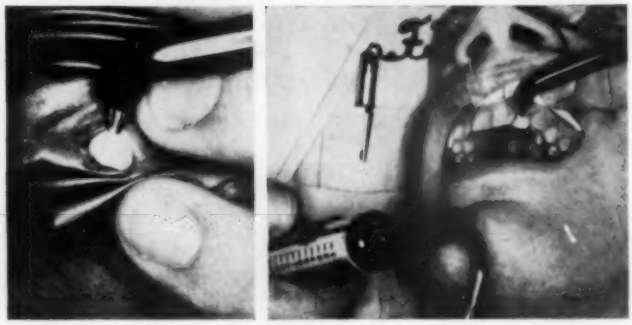

Fig. 3 • Left: Electric pulp tester; rubber dam separation. Right: Electric pulp test with celluloid strips to separate teeth

Fig. 4 • Bitewing films and standard films for diagnosis of periodontal condition

ably sharper in the bitewing films, even though the upper first and second molar, and lower first and second bicuspid contacts are somewhat closed in both exposures.

Dr. Raper, in devising the bitewing film, originally meant it to be used mainly in preventive dentistry for the detection of caries. He mentioned in some of his earlier writings,[1] however, that it was a valuable aid in diagnosing periodontal conditions. Berry[2] elaborated on this in October 1950. He suggested the use of Lipiodol to determine pocket depth. He also explained some of the advantages of the bitewing film in periodontal interpretation.

The dentist should not limit himself to roentgenograms when diagnosing periodontal conditions, because the appearance of the interseptal space or of a pocket might be misleading. Instead of using bitewing films in the anterior regions for the determination of the recession of alveolar process, the films might be used to determine periodontal appearance alone, paralleling the film with the long axis of the tooth by means of cotton rolls if no other method is avail-

1. Raper, H. R. Radiodontia in operative dentistry. J.A.D.A. 18:716 April 1931.

2. Berry, Harrison. Radiopaque materials in the roentgenographic interpretation of periodontal lesions: a preliminary report. J.A.D.A. 43:278 Sept. 1951.

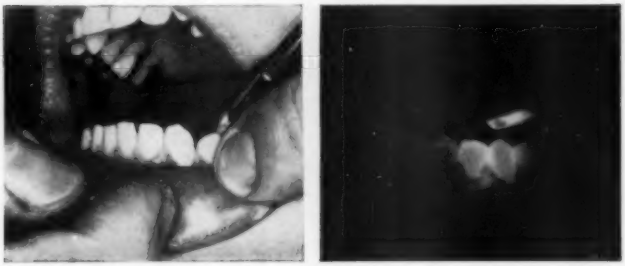

Fig. 5 • Left: Light in place for transillumination. Right: Transillumination showing foreign material or calculus

able, and exposing the films with the ray as nearly parallel to the crest of the ridge as possible. Of course there is no better method to determine pocket depth than by the use of a good periodontal probe. This method should always be used for diagnosis of this type of lesion.

Transillumination is also helpful to examine an area that has already been scaled. Transillumination often discloses subgingival calculus because the calculus casts an opaque shadow (Fig. 5). Transillumination is also valuable to determine whether the radiopacity of an antrum as seen in dental films, might be due to sinus infection. If an infection is present, the patient can always be referred to a physician for complete diagnosis and treatment.

PALPATION OF TISSUES

Another aid to diagnosis that should not be neglected and one that often is helpful in the determination of certain periodontal lesions and their locality is palpation of the submaxillary lymph nodes. By palpating the extraoral submaxillary region, as shown in Figure 6, it is possible to determine to a degree from what locality inflammation may arise.

Palpation is also practical in helping to locate salivary calculi. Of course, the patient's history is of great importance. The fact that the patient suffers pain at specific times, the pain is relieved after eating, and that the smell of sour foods will cause pain, are valuable aids in diagnosis of salivary calculi. Palpation is extremely helpful; proper use of the roentgen ray is also helpful (Fig. 6).

LOCATION OF FOREIGN OBJECTS OR IMPACTED TEETH

The roentgenogram is also extremely helpful in locating foreign objects or impacted teeth. Some of the methods used are the familiar old ones; for example, an auxiliary occlusal film for the upper

Fig. 6 • Left: Palpation of submaxillary nodes. Right: Palpation of floor of mouth

left impacted cuspid (Fig. 7). The cuspid ordinarily would appear to move in the same direction as the tube since the crown would be to the lingual; however, the apex to the root seems to remain very much in the same position, the occlusal film shows the reason why—it is apparently directly above the bicuspid roots.

Figure 7, right, is a true occlusal view taken directly through the long axis of the teeth. It shows the cuspid lying to the lingual with the apex of the root almost directly over the bicuspids. As mentioned earlier, the occlusal film, of course, is extremely valuable in locating salivary calculi, particularly the mandibular salivary calculi. The standard dental film is preferred when upper salivary calculi or the parotid salivary calculi are to be located; an additional film can be placed in the buccal tissue to pick up more clearly the calculi near the opening of the duct.

A good method for locating root fragments in the maxillary alveolar process is shown in Figure 8. A gutta-percha point is placed on the lingual aspect of the alveolar process, a small piece on the buccal aspect opposite some scar or definite landmark. If no landmark is present, indelible pencil can be used to mark the area. The gutta-percha points are retained with denture adhesive powder which is placed over the tissue. The points are then placed in position and one sheet of tissue is laid over the area so that the gutta-percha points cannot be moved easily by the patient's tongue; then exposures are made from distal, lateral, and mesial angles, the depth of the missing root being determined by the amount or the degree of its movement in relation to the two gutta-percha points. This has been found very helpful and, in most instances, saves the patient considerable time in the oral surgeon's chair. If the gutta-percha points do not serve the purpose adequately, the oral surgeon can place a suture needle or some similar object in the area.

INTERPRETATION OF FILMS

In interpreting dental films, the appearance of each individual tooth should be considered first. The person making the interpretation should start either from the crown or the root, determining

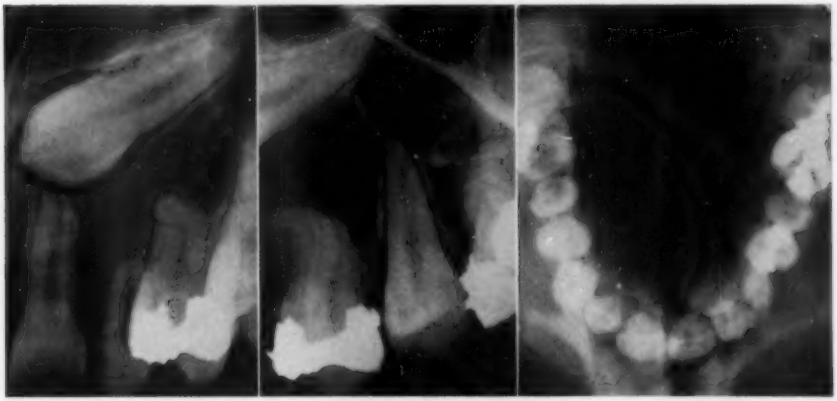

Fig. 7 • Left: Central lateral view of impacted cuspid. Center: Cuspid view. Right: True occlusal view

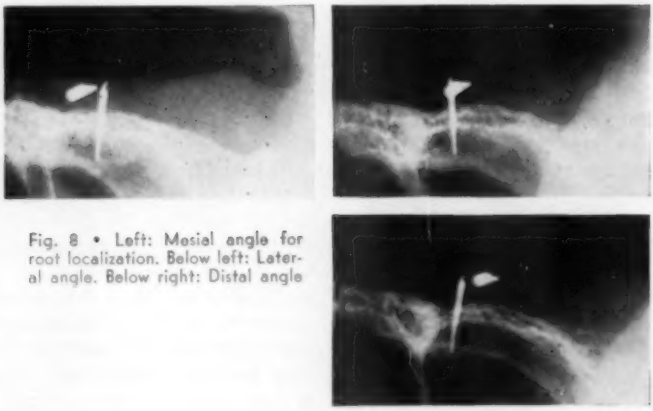

Fig. 8 • Left: Mesial angle for root localization. Below left: Lateral angle. Below right: Distal angle

whether each particular area is diseased. For instance, if the person doing the interpreting begins at the crown, he would look first for caries, abrasion, erosion, and the like on the crown; also, the size of the coronal pulp should be determined. Then, as the operator examines the root, the size of the root canal should be considered, the appearance of the secondary dentin or recession of the pulp, the appearance of the root itself, the periodontal membrane, the lamina dura and the surrounding tissue—each should be taken into consideration.

A considerable amount has been written about the appearance of the tooth itself and the appearance of the periodontal membrane and the lamina dura; not enough has been written about the appearance of the alveolar process itself, except when unusual conditions such as those resulting from Recklinghausen's disease, Paget's disease, hyperparathyroidism or multiple myeloma are present. These conditions are rather uncommon, but they are fairly definite. Naturally, other medical aspects must be considered when making a diagnosis.

Not much has been written about the structure of the alveolar process at dif-

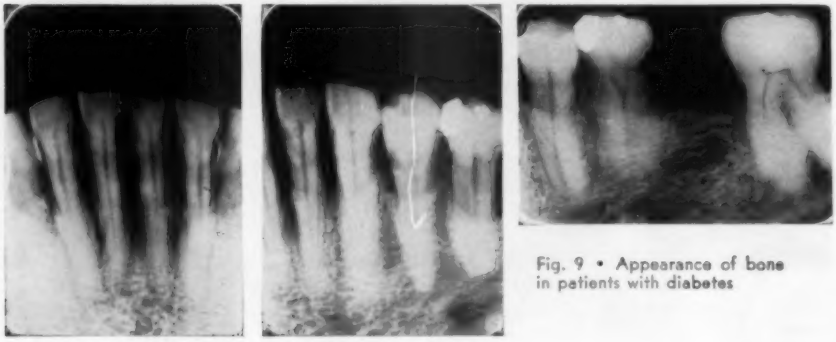

Fig. 9 • Appearance of bone in patients with diabetes

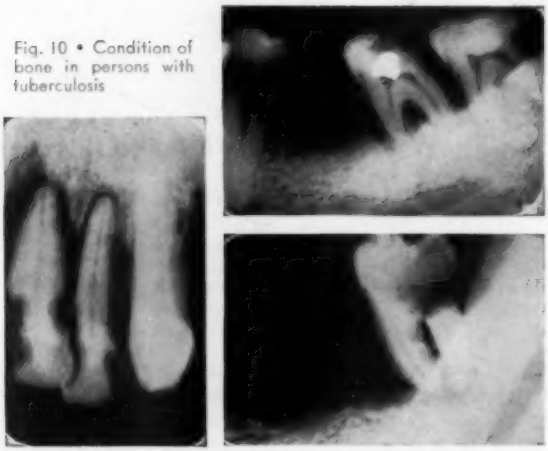

Fig. 10 • Condition of bone in persons with tuberculosis

ferent age levels and when chronic inflammatory conditions are present. A few examples of the appearance of bone in patients with diabetes are shown in Figure 9. The bone appears to have smaller haversian canals and a somewhat more radiopaque appearance. Figure 10 shows roentgenograms of similar bone in tuberculous patients. Observations made in the Multnomah County Hospital indicated that over 50 per cent of the patients with these diseases showed these bone changes provided the condition had not been controlled in its early stages.

CONCLUSION

Interpretation of roentgenograms in itself does not constitute diagnosis; all diagnostic aids must be used.

Many dentists do not use oral roentgenography or any of the diagnostic procedures to the best advantage, however, simply because of lack of knowledge or interest.

There is much in the way of research to be done to improve the dentist's ability to utilize a good, thorough roentgenographic examination.

814 Medical Dental Building

Transmission of Ideas • . . . That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation. ***Jefferson.***

The posterior acrylic resin veneer crown without peripheral undercuts

A. H. Tamarin, D.D.S., Chicago

The posterior acrylic resin veneer crown without peripheral undercuts differs anatomically from the anterior acrylic resin veneer crown without peripheral undercuts[1] in the same manner as the teeth they are representing. In the posterior region the teeth have an additional occlusal surface and the mesial and distal surfaces are either square or rectangular. These anatomical differences involve different problems, and call for different technics to cope with them. The construction of a posterior acrylic veener crown without peripheral undercuts is not difficult, but it is more complicated than that of an anterior one. The entire occlusal surface as well as the buccal surface should be covered completely with acrylic material for esthetic reasons.

The acrylic anchorage of these two surfaces is located on the lingual as well as on the mesial and distal surfaces. The last two anchorages form a union between the buccal surface should be covered completely with acrylic material for esthetic results, the following technic is recommended.

1. Tamarin, A. H. Acrylic resin veener crown without peripheral undercuts. J.A.D.A. 51:344 Sept. 1955.

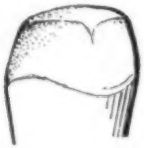

Fig. 1 and 2 • The tooth is prepared properly for the reception of the crown, and an allowance is made of 1.5 mm. on each side of the mesial and distal surfaces. The buccal surface can either be prepared with or without a shoulder. A tube impression is taken, and a stone or plaster model is obtained.

Fig. 3 • A wax coping is obtained by dipping the wet model into a dish of molten inlay wax and withdrawing it instantly. It is then trimmed with the point of a sharp knife around the gingival border, and the coping is removed.

Fig. 4 • Four wax sprues are mounted at each corner of the occlusal surface and united together into one common sprue.

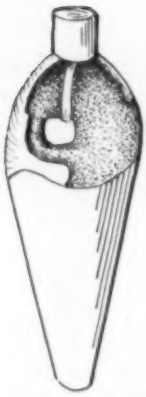

Fig. 5 • Hard investment compound is mixed into a creamy consistency. It is used with a small instrument to fill in the space between the four sprues on the occlusal surface. It also covers up the entire buccal surface. With the point of a small sable brush or with the point of a wax spatula, some of the investment compound, the thickness of 1 mm., is deposited on the mesial and distal surfaces. The design thus formed should resemble right angles, and should unite the occlusal and buccal surfaces. A similar dovetail extension of the investment compound is also produced on the lingual surface of the coping. With a wax spatula, the depressions caused by the investment compound extensions are filled in with wax.

Fig. 6 • A strip of Kerr's green sheet wax, 30 gauge, is cut to a length covering the entire mesial, lingual and distal surfaces. This green sheet wax should also project slightly occlusally over the coping, so that it forms a horseshoe-shaped fence over the occlusal surface. It should also form two axial walls, each about 0.5 mm. in diameter on the buccal surface. The rubber tip of pencil is ground into a V, and that tip is used to adapt the green sheet wax to the wax coping. With a hot spatula the two surfaces are joined around the investment compound extensions which form the channels and also around the gingival margin. The outer surface of the wax walls is smoothed by being rotated over a small flame. The wax pattern is removed from the plaster model, mounted, invested and cast.

Fig. 7 • The finished casting is shown with the channels visible.

Fig. 8 • The completed casting is shown partially covered with opaque material.

Fig. 9 • The occlusal and buccal surfaces are now molded out of wax, invested and processed.

Fig. 10 • The shape and form of the acrylic material as it appears independent of the gold casting.

Fig. 11 • The crown is now finished.

CONCLUSION

The right angle extensions on the mesial and distal surfaces form two channels connecting the occlusal surface to that of the buccal. It is through these channels that the acrylic material of these two surfaces meet, forming an inseparable union.

Since the anchorage of these two surfaces does not depend on undercuts, the maximum exposure of the acrylic material can be obtained, and thereby the appearance is improved.

25 East Washington Street

Modesty in Accomplishment • In April 1922, six months before Halsted's death and thirty-seven years after the discovery of nerve-blocking, Halsted was tendered a public banquet by the American National Dental Association and presented with a gold medal. He was much touched by this spontaneous and generous, though belated, tribute. He wrote to a friend: "The celebration was a success. I am so thankful to have lived to take part in it. Not a wink of sleep did I get during the night of Saturday. I was too exhilarated for repose. Once before in my life I was kept awake by a great happiness; this was the night that I passed successfully the examination for Bellevue Hospital, in 1876." What an interesting, frank, almost naive letter for a man of seventy, already a member of a great many learned societies and an acknowledged world-renowned master, who was so pleased by the tribute to a discovery he made when a young man of thirty-three!

Halsted, after making this remarkable discovery, made no attempt to capitalize on it or to "get himself before the public," as many lesser surgical lights succeed so well in doing. There were too many unsolved surgical problems he was too busy with. *Major.*

Psychological and economic aspects of the fee for dental service

Irvin Tulkin, D.D.S., New York

An important contribution to good dentist-patient relationships is the recognition by the patient of the fairness of the dentist's fee. Sometimes the creation of such an attitude in the patient is a challenge to the dentist's ability to overcome the many psychological problems inherent in the dentist-patient relationship. Only with such acceptance, however, can the dentist expect patient cooperation, appreciation and referrals.

There are hurdles to an ideal dentist-patient relationship which must be surmounted by the dentist. He may project his own fears, frustration and conditioning into the problem of fee presentation. It may be difficult for him to recommend services which he himself dislikes or to consider from the patient's viewpoint dental values of time and expense.

There are dentists who hesitate to prescribe all the services a patient may need; who overestimate or underestimate the value of some services; who hesitate to present large fees even though they are reasonable; who anticipate and fear rejection by the patient, or who fear to operate on children, their own relatives, or on people in certain other categories. Only an awareness of his personal emotional needs and the will to suppress those that are irrational can help the dentist remove the psychological blocks to good patient relations.

The patient, too, may have certain psychological blocks regarding dental service. He may feel that he is being overcharged, or that he will be unable to pay for the services he needs and wants. He may feel that he is being asked to pay for something unpleasant which he doesn't particularly want. Some psychologists believe that transference of unconscious affection or hostility by the patient to the dentist plays a large part in the fee problem. The patient may "look up to" the professional man as to a parent who never requested financial or other forms of assistance. It is not too difficult to see how hostility toward a protector (parent) can arise.

This attitude may be matched by the dentist's tension arising from a feeling that as protector of a patient's health he should not be concerned about fees. These feelings on the part of the patient and dentist may result in a situation which does not make frank communication and therefore complete understanding possible. For the dentist to gain the greatest satisfaction and potential from practice, it is essential that he understand himself, his patient, and their relationship.

AGREEMENT ON SERVICES

Before a fee can be presented properly the patient and dentist must reach com-

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plete accord regarding the services to be rendered. The history of the patient, a diagnosis of his dental condition and proposed services should be thoroughly discussed. Also, in determining the type and extent of services to be rendered, consideration should be given to the patient's personal preferences and to his family, social and business requirements. Such determination must be mutually agreed on before the fee is discussed.

When necessary, the dentist should outline the extent of the fees for emergency services, transitional control services, and the most ideal preventive service that can be rendered. Asking a patient to decide on the type of service helps him evaluate his own needs. Ideally the dental service rendered should be in full accord with all of the patient's other life requirements—his health, emotions, time, job, family obligations and needs, and his finances.

A patient should be shown the values of dentistry in relation to his other needs, and should feel willing to make sacrifices for the kind of dental service that will best meet his needs. Certainly, no dentist would be happy rendering services that might constitute an unusual hardship for the patient.

Should the fee quoted be more than the patient anticipated, the dentist should suggest a method of budgeting payments. Such a suggestion is a valuable aid in the maintenance of good relations with patients.

A direct or implied statement by the patient that the fee is not reasonable, fair or just requires the dentist to review the diagnostic procedures to insure understanding and acceptance of the findings of the clinical examination, the plan of treatment and evaluation of the benefits to be derived from the service. The dentist can hope to change the patient's thinking only if he can discover why the fee is considered unfair, and this must be done without creating hostility, resistance or ill will.

ARRANGEMENTS FOR PAYMENT

Tensions on the part of both dentist and patient, beyond the strain involved in treatment, arise because of cloudy arrangements for extending credit and for collecting fees. Though the acceptance of the fee and a willingness to start treatment may be expressed by the patient, loose credit and collection arrangements may create later misunderstanding.

A cash transaction is one in which the payment of the total fee is made at the outset of treatment. Any other arrangement is a credit transaction. The credit transaction may be in the form of weekly payments, or of bills submitted to the patient at the end of treatment, to be paid in ten days or later. To many dentists a cash arrangement is one in which the services and payments terminate at about the same time. Such an arrangement usually results in waste of time and often in loss of good will.

From time to time the dentist must discuss payments with the patient who allows his account to become delinquent, or worry that he is permitting the creation of a bad account.

Naturally, with established patients whose payment habits have been satisfactory, there is little need to discuss payment terms—unless the current services are much more extensive than those usually performed for the patient. It is advisable to ask new patients how they would like to pay for the services. Frequently the patient will suggest a satisfactory time payment program. If not, both the cash and credit policies of the office should be outlined. Whatever method is selected, the patient and the dentist should come to an agreement on the amount of the initial and subsequent payments.

One of the best and most generally acceptable methods is a budget payment plan operated by the dentist himself in which credit is extended without the use of a bank or finance company. Only the

use of a third party receipt, contract or reminder forms is essential, and extensive training is not necessary for the operation of such a plan. Although the dentist may need to finance such a plan personally for a short time, he soon will be rewarded by a more productive and lucrative practice.

The budget plan is more flexible and more readily acceptable to most patients than are other payment programs. It is less expensive to the dentist and the patient, and losses are no greater than by other methods. More patients can be served and better dentist-patient relationship results.

The principles that govern the making of effective and satisfactory credit arrangements are:

1. Unreserved acceptance by the patient of the plan of treatment.
2. The setting of the approximate completion date of the initial service.
3. Steady employment and an established residence by the patient.
4. Arrangement for the payment of specific amounts on a specific series of dates after payment of the retainer fee.
5. Involvement of a third party who helps with the financing or who furnishes the necessary forms and follow-up letters.
6. Systematic reminders and follow-up letters after the first departure from the payment arrangement agreed upon.
7. The arrangement of payment terms separate from, and independent of completion of services and from the dates, number and length of sessions.

The involvement of a third party in a collection arrangement obviates the likelihood of resentment of the dentist when the patient must be reminded of payments. Among the third party plans used are bank loan plans, finance plans and office budget plans.

Executives and other patients who can pay larger monthly amounts (several states permit weekly payments), and whose credit is acceptable to banks, are recommended for bank loans, the bank making total payment to the dentist in advance of treatment. In some states the dentist can receive a bank loan without recourse because of the cooperation of the local dental society. A reserve for losses has been provided by an additional service charge to the patient.

A dental finance plan is recommended for patients who may not qualify for bank loans, who require long-term credit and who, for one reason or another, cannot be included in the dentist's own budget payment plan. The interest under this plan does not run higher than a bank's interest if extended over the relatively longer period permitted. The relationship and follow-up service is usually more tactful and effective than in the case of the bank loan.

FUTURE CARE AND MAINTENANCE

Maintenance of good will is essential for a continued pleasant patient-dentist relationship. The patient must accept the idea that all appliances wear, that changes in health and in the mouth are unpredictable, that periodic care and maintenance prolong the usefulness of the initial service, and that future new services, repairs and remakings will entail necessary additional expense. All this implies that the patient is paying for services, not for the appliances incidental to them.

This means also that in the course of his contact with the patient, the dentist must be able to gain full acceptance of the limitations of the services and the need for future treatment and maintenance.

An arrangement for future care, with a specific monthly maintenance fee, would be the ideal arrangement. Such an arrangement is possible only if and when the dentist wins the patient's trust, and with that trust the willingness to be guided by the dentist's superior knowledge of dental health.

342 Madison Avenue

FDA protection and the dentist: a review and forecast

Irvin Kerlan, M.D., Washington, D. C.

The Food and Drug Administration is the agency responsible for carrying out the provisions of the Federal Food, Drug, and Cosmetic Act of 1938. This statute was enacted to protect the health and welfare of the public. The manner in which the dentist shares in providing this protection as well as some of the ways in which he benefits from this law will be outlined in this paper.

HISTORY

More than a half century has gone by since the passage of the Food and Drugs Act of 1906, which was the first federal legislation to deal with general regulation of foods and drugs. In its day, the 1906 law was an effective instrument in bringing about many improvements in foods and drugs in the consumer's interest. Yet the 1906 statute was not adequate to cope with rapid advances in technology of industry. There developed many loopholes in consumer protection.

The Federal Food, Drug, and Cosmetic Act of 1938 improved consumer protection in several respects. It provided for informative labeling on all regulated articles and set forth specific labeling requirements for special dietary foods; it enabled correction of insanitary practices, and authorized setting of food standards; it extended control over drugs to include, among others, the provision that new drugs be cleared as to safety prior to their being marketed; and, for the first time, it included devices and cosmetics. Improvement of the nation's foods and drugs, honestly labeled, was promoted.

It is of interest to recognize that this statute regulates an interstate volume of foods, drugs, devices, and cosmetics conservatively estimated to be in excess of 60 billion dollars, as well as a 3 billion dollar volume of imports.

Since 1938 Congress has repeatedly amended this law to deal with problems as they have arisen, and thereby has kept it up to date. For example, predistribution testing and certification of insulin and several of the antibiotics has been provided by a series of amendments. Too, the responsibilities of the FDA have changed as a result of these amendments, as well as of the increase and the shift of the population and the new products and processes being constantly developed.

ORGANIZATION

The FDA is a relatively small federal agency whose personnel numbers about

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1,000 in the enforcement program and about 170 in certification services. The full operation of FDA is conducted on an annual appropriation of about four cents per person, a noticeably inexpensive protective service for the American public. With $6,779,000 appropriated for the fiscal year 1957, our largest appropriation in operating funds to date, an attempt is being made to obtain an increase in staff and to afford the public greater protection.

At the headquarters of FDA in Washington there are the Commissioner's office and five administrative bureaus. One, the Bureau of Biological and Physical Sciences, consists of seven scientific divisions. The 16 field districts have offices in principal cities throughout the country. Each district maintains a laboratory and inspectional staff. In addition, there are 36 resident inspection stations, thereby providing FDA offices in 52 cities. This means that anyone can readily contact an FDA officer in his home or nearby city.

The scientific bureaus and divisions advise the Commissioners on technical matters; conduct scientific research necessary to acquire data needed to appraise special problems; interpret results of analyses; evaluate claims on drug labels; develop methods of analysis; make analyses that the field laboratories are not equipped to handle, such as bioassays, bacteriologic tests, toxicity studies, and pyrogen tests; certify safety and potency of certain antibiotics, insulin, and coal-tar dyes; conduct and arrange clinical studies; review the safety data submitted in applications for new drugs for man and animals prior to marketing; devise and conduct analyses for vitamins and other nutritional factors; and examine the physical properties of devices.

REQUIREMENTS OF THE ACT

In presenting the requirements of the Act it should be realized that most manufacturers voluntarily comply to provide the best foods, drugs, devices and cosmetics in the world. When these commodities are offered for import, they must meet the same requirements as those imposed on interstate shipments. Although only a small percentage of the total production is defective and subject to court action, even the small fringe of careless or unscrupulous operators is a big problem for an organization the size of FDA.

It is easy to understand how the FDA operates by following an inspector through a pharmaceutical manufacturing plant. He checks the sanitation, the condition of the ingredient materials, the controls of manufacture to insure proper composition of the final drug, and also obtains copies of labeling for review by administrative officers to ascertain if the article is properly and truthfully branded. If the drug appears not to comply, shipments are sampled and analyzed, and if found violative, seized. The shipper may be criminally prosecuted or enjoined from interstate shipment of the remainder of the violative production. These actions are brought in the federal courts. In a criminal prosecution the maximum penalty for each violation of a first offense is a fine of $1,000 or imprisonment for one year or both. On a second offense, or if the defendant intended to defraud or mislead, the maximum fine is $10,000 and maximum imprisonment is three years for each violation.

In a court contest of these actions, the burden of proof is on the government to establish that the law was violated. In the presentation of court cases involving dental products, the government relies on the assistance of outstanding and recognized experts in the field of dentistry to explain to the court and jury the dental basis for the charges from the dentist's standpoint. It cannot be said too often that it is only with full cooperation of the dental profession that this Administration is able to bring about effective corrections in the labelings of the various

classes of regulated commodities in the general interest of the public welfare and the profession in particular.

Foods • Adulterations involving health are first in order of significance in the food field, and these are of varied character. Under the provisions of the Act, the addition of poisonous and deleterious substances to food is prohibited unless such substances are necessary for production or cannot be avoided in good manufacturing practice, or, if pesticide chemicals used in or on raw agricultural products, they serve a useful purpose. In such instances provision is made for the establishment of safe tolerances by regulation. The practice of using poisonous preservatives to check decomposition which could be avoided by adequate plant sanitation is a violation which has been condemned by the courts.

Food poisoning outbreaks usually originate in the home where the food is prepared, but occasionally they are traced to foods of interstate origin. The Administration investigates reported outbreaks promptly so that the offending food can be identified and located. If interstate shipments are involved, remaining lots can be removed from the market in time to avert further consumer injury.

Drugs and Devices • The principal requirements of the Act with respect to adulterations and misbrandings of foods are much the same for drugs and devices. These articles must meet the following provisions of the Act:

The article must conform to the strength, quality, and purity which it purports to possess. Official drugs are described in the United States Pharmacopoeia and the National Formulary. Nonofficial drugs are as described on their labels.

The labeling, including printed and graphic matter which accompanies the article, must be truthful. Extravagant therapeutic claims made for various articles constitute a major problem.

The label must bear the name and address of the manufacturer, packer, or distributor, as well as a statement of the quantity of contents. In this connection a note of caution should be stressed that the vendor of drugs be known to be reliable.

A drug must also bear the common or usual name of each active ingredient, including the quantity, kind and proportion of any alcohol, and in the case of certain substances, whether active or not, a quantitative statement of the presence of the drug. Drugs sold for prescription use only must bear a quantitative declaration of each active ingredient so that the product can be evaluated by the professional user.

The labeling must bear adequate directions for use. In the case of articles sold for lay use, proper indications for use must appear and full directions for use in such conditions must be supplied. Drugs which can be used safely or efficaciously only under the supervision of dentists, physicians, or veterinarians must bear the statement: "Caution: Federal law prohibits dispensing without prescription" in lieu of directions, provided the other requirements of the regulations dealing with this section of the law are met. For products distributed under this exemption, the manufacturer or distributor supplies directly to the dentist, on request, informative material which sets forth detailed scientific and technical information relating to the use of the article.

Drugs and devices must not be dangerous to health when used in the dosage, or with the frequency or duration prescribed, recommended, or suggested in the labeling.

Durham-Humphrey Amendment • The Durham-Humphrey Amendment to the Act, which became effective April 26, 1952, prohibits the sale or dispensing of certain drugs by pharmacists without a

proper prescription. This requires that the pharmacist dispense only the drugs ordered on prescription in the quantities designated. In connection with the refilling of prescriptions, the dentist, just as the physician, can facilitate compliance with the law if, at the time of writing or telephoning the original prescription, he includes instructions as to the number of times the prescription is to be refilled. Unless specifically noted by the prescriber, the pharmacist must check with the dentist or physician for approval before issuing subsequent amounts of the drug. Pharmacists who fail to observe these provisions are subject to prosecution.

This is an enforceable safeguard to the dentist and his patients to avoid their obtaining unlimited access to potent drugs such as the barbiturates, amphetamines, and others which are potentially harmful. If, through investigation as a follow-up of complaints from reliable sources, such as dentists, physicians, local police departments, the patient's family or relatives, state pharmacy boards, pharmacists or others, the FDA learns that a pharmacist is illegally selling drugs or refilling prescriptions, proceedings are instituted against such pernicious misuse of drugs. This is in no sense an attempt to use the law to regulate or control the practice of dentistry or the practice of pharmacy, but only a protective measure to insure that certain types of drugs be sold only on prescription and that the prescription be refilled only as authorized. The prescription restrictions are more important today in view of the potent drugs currently available. It is to be noted that 50 to 90 per cent of drugs prescribed by physicians and dentists and used in hospitals today were unknown 15 years ago, and many of these, although extremely potent, are also capable of great harm.

Illegal sales of prescription drugs were charged in 114 drug and device prosecutions brought in the last fiscal year. The FDA has information that "pep pills" and other prescription items popular for nonmedical use are peddled by "pushers" in bars, "flop houses," and on "skid row" streets, which makes an increasingly complex problem. These drugs have been definitely implicated as being used by kidnappers, counterfeiters, and other criminals to remove inhibitions from antisocial practices. They are also used by drivers to stimulate them to keep on despite fatigue—which has contributed to highway accidents. It is incumbent on everyone to exert every effort within his power to keep such drugs within the proper medicodental uses for which they are intended.

Drug Warnings • The labeling of a drug must bear warnings against unsafe use in those pathological conditions or by children where its use may be dangerous to health, or against unsafe dosage or methods or duration of administration or application as are necessary for the protection of users. The general public who purchase drugs for self medication receive such informative guidance, when necessary, in the article's labeling. For example, toothache preparations carry the caution that the drug be used temporarily, only until a dentist can be consulted. Likewise, in the case of potent drugs and devices, appropriate warnings and contraindications are made available to licensed practitioners in the labeling and related informational material.

In the case of hypnotic or narcotic drugs or their derivatives intended for use by man which have been found to be habit-forming, the label must bear the statement "Warning—May be habit-forming" in juxtaposition to the quantitative declaration of the drug.

Misbrandings • The healthy effect of the Act to rid the market of seriously misbranded products has not eliminated entirely such nostrums. The amazing fact is that the snake oil and soothing syrup preparations with ambitious and unre-

stricted therapeutic claims are still encountered.

Many of the misbrandings in the dental field are associated with misleading claims for tooth pastes. One such product, consisting essentially of bentonite, water, calcium carbonate and small amounts of fixed oil and methyl salicylate, was marketed as "No Equal Tooth Paste." It was offered to be effective for rheumatic and pulmonary affections, disorders of scrofulous and eczematous type, abscesses, sores, wounds, toothache, pyorrhea, bleeding gums, dead and abscessed teeth, inflamed tonsils, sinus trouble, tongue blisters, swollen gums, in checking ailments and stopping pain, relieving pains in the gums of teething infants, preserving teeth, and in absorbing poisonous substances of the body. Seizure of this product as misbranded was allowed to go by default by the company and the goods were destroyed. The shipper pled guilty in a criminal prosecution and the court imposed a fine of $100 and costs.

Other dentifrices have been proceeded against for their unwarranted claims for efficacy in the cure, mitigation, and treatment of pyorrhea, gingivitis, Vincent's angina, and all other diseases of the oral mucosa.

A vegetable sea food, "Ce Kelp," was represented, among other broad claims, to be effective for dental decay and pyorrhea.

Dental devices have also been encountered with ascribed special benefits far in excess of their recognized uses. "Ko-rekT," consisting of two counter-rotating rubber disks mounted on metal shafts turned by a hand crank, was established to be misbranded when offered, among other false claims, for preventing and healing gum infections, preventing tooth decay, keeping the gums and mouth healthy, and eliminating tartar formation. Seizure of the device and criminal prosecution of the defendant resulted in favorable decisions for the government. In the case of the criminal action, the trial was before the court and jury. The court sentenced the defendant to 90 days in jail but suspended this sentence and placed the defendant on probation for one year, and ordered him to pay the costs of trial.

A magnetic teething necklace was the basis of a seizure several years ago in view of its reckless representations. This device consisted of velvet-covered strips of steel with ribbons at the ends for tying and was packaged with a box label and circular showing a crying baby without a necklace and a smiling baby wearing the necklace. It was offered when worn day and night as a quick, gentle, and effective treatment or preventive of pain and suffering by children during the teething period, and to impart a healthful influence on the growing teeth and the whole system, among other claims. This action was allowed to go by default, and the devices were destroyed.

Unjustified claims for therapeutic benefits of dentifrices necessitate a stronger expression of views and fundamental research by dental investigators to forestall the needless misguiding of persons as to the worth of dental creams, washes and powders. The dental profession should strengthen its position with convincing scientific facts to refute the blatant and careless representations currently seen all too frequently in popular periodicals.

Most serious and tragic is the apparent exploitation of worthless remedies for cancer. The largest operators in this field are running so-called clinics or hospitals which are designed to cloak their valueless treatments with an aura of scientific authenticity. Some of these establishments are actually in the multimillion dollar class and are visited by thousands of patients each year. Although some fear they have cancer, many of these people actually do, and lives are being lost needlessly because they are putting their trust in fraudulent remedies.

Since cancer quackery is a lucrative

business, the FDA is certain to become involved in prolonged litigation whenever an action is brought against such articles and their promoters. For years the public has been educated to look for the danger signals of cancer. The importance of early diagnosis and appropriate treatment competently provided has been used in public health education programs. The government, the pharmaceutical industry, and the American Cancer Society are spending many millions of dollars every year for research to find methods for treating cancer. Progress is being made. To stem the practice of exploitation of cancer and other types of health quackery, the dentist can serve to advise his patients, when his views are sought, to obtain recognized therapy.

The problem of regulation of the activities of medical quacks is basically a state responsibility in which the FDA can engage only when state lines have been crossed in shipping the "treatment." Members of the dental profession are in prominent positions to bring such persons to the attention of responsible boards and to express highly valued opinions when their states consider problems affecting the health of their citizens.

New Drugs • From the public health standpoint, the inclusion in 1938 of the new-drug section in the Act represented Congressional recognition of a constructive and valuable contribution to the safe use of drugs. Drug manufacturers have developed new agents which have greatly changed therapeutics throughout the world. Legally no "new drug" can be introduced into interstate commerce unless an application filed with the Secretary of the Department of Health, Education, and Welfare has been permitted to become effective. Through this procedure, the safety of the drug under the conditions recommended or suggested is established, and the marketing of untested and possibly dangerous concoctions is prevented. Thereby a service is also rendered the manufacturer or distributor, since the marketing of an unsafe drug obviously is not in his best interest.

In the 18 years of operation, more than 10,000 new-drug applications have been submitted of which over 7,000 have become effective. Through this procedure all of the new chemotherapeutic agents, including all the sulfonamides except sulfanilamide, the new analgesics, antibiotics, antihistaminics, most of the hormones, and the many other therapeutic agents have been introduced.

POISONING CONTROL

The growing awareness and concern over the public health hazards of many classes of industrial and common household chemicals are reflected by the activities of many national health organizations.

For a number of years the Bureau of Medicine of FDA has been compiling from various sources, especially the published literature, information on untoward effects, both therapeutic and accidental, of drugs, devices, cosmetics, caustics, foods and the considerable number of presently unregulated household chemicals. Currently, to augment this repository of information, the Administration is encouraging dentists and physicians to submit reports of untoward effects from drugs, devices, and cosmetics which they encounter in their professional practices. This information will be especially beneficial in appraising new drugs and other potent substances now available and in recommending more informative labeling or other appropriate measures.

In May 1955, the American Association of Medical Record Librarians designated a special committee to work with the Food and Drug Administration in developing methodology to set up pilot studies in selected hospitals for reporting untoward effects from therapeutic agents. A report form has been designed and the development of this program is being

pursued through pilot studies in 11 hospitals, which may represent the beginning of a national activity.

CITIZENS ADVISORY COMMITTEE

In January 1955, the secretary of the Department of Health, Education, and Welfare appointed a committee of 14 distinguished citizens to conduct a study of the Food and Drug Administration. The committee was made up of representatives of industry, educational institutions, medicine, law and the judiciary, labor, and groups representing the consumer's interests. The first meeting with the secretary was on February 3, 1955. The committee filed its report on June 30, 1955. This report indicates that the Food and Drug Administration is not presently staffed or equipped to render the degree of consumer protection which the Committee believes Congress intended the public should have. It recommended a threefold to fourfold expansion of the Administration with the application of more effective technics to broaden consumer protection. Study and planning to implement the recommendations are underway.

CONCLUSIONS

From this review of the activities of FDA, it is readily evident that the FDA shares a common desire with the dental profession to protect the health of people. Working closely together with mutual regard and understanding of the problems, even greater benefits can be provided to patients, families, and the dental profession.

To Achieve Wisdom • When every farmer leaves his acres a little better than he found them; when every worker leaves the imprint of human honesty and human dignity on every task performed, however humble; when every lawmaker helps to render human relations a little more equitable; when every judge leaves his court a tradition of a little more justice; when every doctor, every teacher, every investigator works more for love and less for hire; when every statesman leaves the path of compromise, conciliation and approximate justice a little more accessible and secure, we shall have something greater than fat cattle, marble palaces, tall buildings, radios defiling the pure ether with black lies, and mighty airships spewing pain and death on women and children. Even then, we shall not have perpetual health, not even perpetual youth. But we shall be well on the road to earn the designation: wise men. We shall still struggle for life and light, but shall have left behind the follies, the fears, and the fights of the jungle. *Anton J. Carlson, The Fundamental Sciences—Their Role in Medical Progress, 1939.*

The dentist and his patient

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The individual patient constitutes the foundation on which a dental practice rests. Collectively, the dentist's family, his church, his friends, his lodge and his dental society claim a large share of his everyday life, but it is the individual patient who occupies his chair that underwrites the support necessary for all these activities. It is logical, therefore, that the dentist should give considerable thought to the habits, customs and idiosyncrasies of this all-important person.

Strangely enough, relatively few articles are devoted to the art of cultivating the patient-dentist relationship. So much consideration has been given to the development of technical competence that it is possible dentists have overlooked what is actually embodied in the term profession. It is true that the term profession connotes a body of knowledge and skills capable of being transmitted through the process of formal education. More relevant to the point at issue, however, is the impact of a profession on the human being as a person—and as a personality. The primacy of the individual relegates to a position of less importance all other considerations, including the economic. This is the decisive factor which differentiates a profession from a business.

Thoughtful men in the profession have long noted that many dentists who possess superior technical ability do not have practices commensurate with their skill, whereas others who are far inferior technically possess certain traits of personality which make them outstanding successes. One key to this seeming paradox lies in the recognition of the well-known psychological principle that the urge to be important and to be so recognized is present in almost all of us. Successful dentists, consciously or unconsciously, defer to this most compelling force in human nature. In their offices, every man is king—no matter what his station in life—every woman is a queen and every child is a prince or princess. They are treated as such.

It is obvious that no two people are identically the same in habits, customs, likes and dislikes. It is also obvious that no busy professional man has the time to search out the various whims and idiosyncrasies of every patient who comes to his office. But it is equally obvious that the dentist cannot expect the patient to alter his personality so as to conform to the policies of the particular dental office in which he finds himself.

The alert dentist recognizes the fact that the human being in his chair is an extremely complex entity. In addition to his dental afflictions, he is usually concerned with a host of other problems—economic, social or possibly those pertaining to the health of his family or himself. Any of these factors could have an influence on his personality and affect his attitude toward every person with whom he comes in contact—including the dentist. But as anyone accustomed to dealing with the public knows, personality patterns which would affect re-

lationships are usually revealed within the first few minutes of acquaintance. The trouble comes when the dentist fails to observe these patterns and inadvertently says or does exactly the wrong thing at exactly the wrong time. For example, no man with an overdue note at the bank should be forced to listen to a long discourse on mouth rehabilitation.

The fact that patients do not conform to any set pattern, but range through the entire scale of all known human characteristics contributes in a large degree to the fascination of the profession. It also presents many pitfalls for the unthinking; for each and every dental patient is a case study in personality and psychology. Some individuals are extremely fussy, others are easily satisfied. Some are slow in thought, others grasp an idea quickly, a great many are fearful of any dental procedure, others have an extremely high pain threshold. Whereas the majority of patients are concerned with the question of fees, there are some who are only anxious that they receive the very best regardless of cost.

The list could be expanded almost indefinitely, but the point is that the reaction philosophy and mental attitude of the dental patient should receive as much attention from the dentist as the technic of the professional work involved. Technic and professional integrity constitute the foundation on which the dentist stands. This foundation, however, is undermined in countless offices every day by careless disregard for and indifference to the individuality of the patient. The result of many years of study, work and thought may be lost with one single sentence or one phrase carelessly uttered. Too little realization is given to the thought that what may be a perfectly good chairside manner for Mr. A could be in extremely poor taste for Mr. B. and if attempted on Mr. C. could result in the loss of a friend and patient. No professional problem, no matter how critical or important it may be, is greater than the personality of the individual who presents it.

Another key to the door of a happy patient-dentist relationship lies in a thoughtful analysis of the word patient. This word is derived from the latin "pati" which means to suffer, and down through the ages has finally arrived at its present meaning: "one who undergoes treatment at the hands of the dentist or physician." In this connection, it is rather interesting that in legal parlance, the individual is known as a client; in the business world, he becomes a customer; in the field of arts and letters, he is known as a patron.

Only in medicine and dentistry is a term applied which carries the connotation of suffering. It is this connotation which constitutes one of the barriers between the profession and the public today. When a man is confronted with a major surgical operation in today's modern hospital, he gives little or no thought to the possibility of pain during the actual operation. He knows beyond all doubt that modern science has removed all possibility of sensation.

An appointment at the dental office, however, carries no such assurance, because dentists vary greatly in the importance they attach to the skill of blocking pain sensations. To be indifferent or callous to the fact that a patient is suffering is inexcusable and has cost many men many patients. The mechanical act of cavity preparation is relatively simple, but the manner in which it is performed may range from the efficient to the crude; from the painless to the excruciating. Both technics may yield excellent results but one will leave a memory of grateful relief, whereas the other inspires an unhappy dread of future appointments. The successful dentist knows that he must blend his ability as a healer with a sympathetic understanding of the natural apprehensions of those seeking help.

The amount of good dentistry seen in the mouths of patients far exceeds the bad, but it is a common occurrence for

a dentist to view excellent work and yet find the owner disssatisfied and displeased —not necessarily with the work itself, but with the service which accompanied it. It is a strange fact and one not too well recognized that the difference between a successful practice and one which merely provides a good living is not so much a question of professional ability as it is of the little services, attentions and the restful confidence which one operator extends and the other does not.

It well behooves every practicing dentist —and his auxiliaries—to search constantly for new ways of extending service to every man, woman and child entering his office. The receptionist who greets the patient, the assistant who seats him in the chair, the hygienist who does the prophylaxis and finally the dentist who examines the mouth and charts the work to be done—all should have the same idea in mind: "Here is a man who has passed dozens of other offices to enter ours. Let us greet him cordially, treat him gently and speed him on his way."

Too many men concentrate on professional technic exclusively and forget the human element of their practice. It is a fundamental truth that a warm smile, a kind act or a sympathetic phrase will establish much more cordial relationship between a dentist and his patient than the most beautiful piece of prosthetic work or the most complicated filling ever placed. People are human, they want to be treated as humans; they are in the office primarily for their own benefit and not the dentist's and they resent being treated as robots with so many fillings to be placed at so much per filling.

Still another key to success in patient relationship lies in the realization by the dentist that whereas dentistry is not a commercial venture, it is most decidedly subject to the laws, rules and regulations of the business world. Professionally, the dentist is obligated to fulfill his ethical responsibilities; economically, he is obligated to follow the laws of business procedure. The scientific business administration of a dental practice is not only a cardinal factor in its success; it is the one important aspect of office procedure that is bound to be noticed and appreciated by patients.

Just as the dentist, in his business dealings with the outside world, resents long periods of waiting, indifferent service and short, curt methods of handling financial transactions, so too does the patient resent that kind of treatment from the dentist's hands. A two o'clock appointment should be kept at two o'clock —not at two-twenty. The ears of patients should not be bombarded with trivial talk between the dentist and his personnel. For most patients, dentistry is serious business and the presence of a patient in the office is the sole reason for its existence. In the discussion of fees, people appreciate knowing in advance exactly what a piece of work will cost them. It is much better for the dentist to quote a fee that will cover unforeseen exigencies than it is to be forced into raising the quotation when the work is half completed. If it becomes absolutely necessary for the dentist to increase his original quotation, the patient is entitled to a full explanation. If it happens consistently, the dentist should radically change his examination technic.

It would be well for the dentist to remember that the discussion of fees provides a common ground for both dentist and patient. Although the latter may not understand dentistry, he does understand money. Right here is a wonderful opportunity for the dentist to extend his services to more and more people. The dentist must have a good knowledge of what it costs him to open his office each day; his fees should be based on that knowledge with a provision for a fair return for his labors. Too many times fees are based on what the individual dentist thinks the traffic will stand—which is one reason for thousands of idle hours in dental offices all over the country.

Exorbitant fees have never yet built a successful practice. The broader the base on which a practice stands, the more people it serves, the stronger and more secure it becomes. For the professional man, a thousand bosses are always better than one.

Never before in the history of dentistry have there been such opportunities for service as there are today. People are much more conscious of oral health than ever before, and they are much better equipped financially to provide for it. It becomes exceedingly important, therefore, that individual dentists study seriously better and more efficient ways to provide more dentistry for the American public. Socialized dentistry, although modified, is still the law of the land in Great Britain. The people there like it and let us not forget that the people—not the profession—are the final arbiters.

Although technical ability alone might be sufficient to insure a moderate success under political regulation, much more is required for continuing successful progress under private auspices. The trait of a competent professional personality may be acquired as surely as the trait of mechanical competence. One has to work at it in the same determined manner as that in which he sets out to become technically perfect. Just as eagerly as the dentist strives to produce a beautiful piece of prosthodontics, so he should strive to create harmony in every phase of professional activity, from the time of the first greeting at the first appointment until the final good-by at the end of the last visit.

No standardization of procedure is possible, since no two patients are identical in their outlook on life. Nevertheless, all human beings have certain psychological characteristics in common, and the constant study of each patient as he comes before him will enable the dentist to serve all humanity in a more understanding manner. To paraphrase the Book of Books: knowledge begets enthusiasm, enthusiasm begets confidence, confidence begets diligence and diligence most certainly begets success. All of these traits combined with a genuine love of dentistry and the people who turn to it in time of need will give any dentist the feeling of pride, satisfaction and inner contentment which is unmistakably stamped on the faces of successful men.

120-124 College Avenue

Fluoridation of Public Water Supplies • The Supreme Court of Oregon on January 11, 1956, in the case of *Baer v. City of Bend*, confirmed the decree of the circuit court which had sustained a demurrer to the complaint brought to enjoin city officials from fluoridating the Bend water supply.

The plaintiff contended that fluoridation would deprive him of his liberty without due process of law secured by the 14th amendment and encroach on his freedom of religion secured against Federal intrusion by the first amendment and similarly secured against State intrusion by the 14th amendment. The court, noting the various cases and other authorities (and the express concession of the plaintiff that dental health is a proper field for the exercise of State authority), held that the fluoridation measure of the city of Bend was a reasonable law for the protection of the public health and did not violate any religious or other liberties guaranteed by the Constitution. *Public Health Reports 71:503 May 1956.*

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Editorials

Viral hepatitis: guard against its transmission

Recently there have been published in both the medical and public press several reports of a new, serious, sometimes fatal malady—viral hepatitis. To date but few instances of the disease have been reported in which dentistry appeared to be involved, but the potential danger is there. The disorder first came to the attention of medicine when it was noticed that transfusions from certain batches of blood were followed by severe episodes of hepatitis.

Blood for transfusions is often pooled from a number of donors and blood from one virus carrier may contaminate several liters of the batch in which it is mixed. Localized outbreaks of the disease have followed mass inoculations during which the same syringe of antigen solution was used, even though a newly sterilized needle was employed for each individual. Even an infinitesimal quantity of virus-containing blood left in a syringe or needle after use on a virus infected patient may infect the next individual on whom the syringe or needle is used.

Syringes, needles, scalpels and other instruments which may have been in contact with blood should be sterilized by autoclaving at 250°F. for at least ten minutes, or by dry heat at 320°F. for at least an hour or disinfected in boiling water at 212°F. for at least 15 minutes. The virus is not inactivated by "cold disinfecting" solutions. When an injected drug is drawn from a multiple dose container, both needle and syringe should be sterile. If a second withdrawal of fluid from the vial is required, a newly sterilized syringe and needle should be used; otherwise there is danger that a small amount of blood may be transferred to the contents of the vial with the result that subsequent use of the material may transmit the virus to other patients. Strict observance of these precautions prevents the dentist from being party to the transference of viral hepatitis.

Twelfth International Dental Congress: Italy's ancient city host to modern science

Although arrangements are now well advanced for the Twelfth Congress of the Fédération Dentaire Internationale to be held September 7 to 14, 1957, in Rome, there is still time for latecomers to complete plans to attend this outstanding meeting.

For U. S. dentists and their families, no less than nine interesting tours by ship or air have been outlined by the travel consultant of the U. S. A. Section of F.D.I. Each tour allows the Congress visitor to see many of Europe's scenic, historic and artistic wonders. The dentists of Europe, because of the shorter distances they must travel to and from Rome, have a choice of several proposed motor car tours.

The 1957 Congress is the first in five years, and will be attended by about 6,000 Congress members from every part of the world. The scientific sessions will be held in the Palace of Congresses, with simultaneous translations in the five official languages (of which English is one). An exhibition of oral hygiene and social dentistry under the patronage of the High Commissioner for Public Health will remain open from September 7 to 30. A scientific exhibition will show the development of dental science, and collections of dental books on loan from various universities will be on display. Particular attention has been given to the organization of a trade exhibition which will be representative of dental manufacturers throughout the world. This exhibition should enable the attending clinician to observe the manner in which manufacturers in various countries have approached the problem of design.

Rome will have many other attractions for those visiting the Congress. The organizing committee has arranged several events, including a cocktail party in the cloisters of the baths of Diocletian, an open air concert, a drama in the Theatre of Imperial Rome, a Congress Ball, Congress Dinner, a golf tournament and trips to the surrounding countryside.

Pope Pius XII has announced that he will receive Congress members in public audience in the Vatican, and the Lord Mayor of Rome will give a reception for visiting dentists.

Information regarding travel to and from Rome and accommodations has been published in several past issues of THE JOURNAL. Additional information may be obtained by writing Obed H. Moen, 6 Main St., Watertown, Wis.

Medicare: plans for dental care still in the making

Medicare, the government's program to provide fringe benefits to military personnel, has been in operation for the past six months but as yet it has scarcely got off the ground. The delay applies particularly to the dental phase of the project.

Medicare was originally designed to provide health benefits of limited scope to the dependents of military personnel, and the format of the Blue Shield program was selected as a pattern for determining the limitations. In essence, Medicare provides payment for services rendered in hospitals for the relief of acute medical and surgical conditions. In adopting the Blue Shield pattern, the Department of Defense inherited the same difficulties which exist in most Blue Shield programs; difficulties caused by the failure to recognize that certain acute medical and surgical conditions involving the mouth and jaws are normally treated by the dentist, even though they may be treated legally by either the dentist or the physician.

The planners of Medicare, without the benefit of adequate dental advice and consultation, did give some belated consideration to the fact that certain distinctly dental services be provided if the physician might consider them necessary for the resolution of a condition under his care. The planners unfortunately selected the term "adjunctive dental care" to designate this type of dental service. In so doing they followed the principle that dependents would be eligible for such dental care as the physician deemed necessary. The annual cost of this "adjunctive dental care," in the estimation of the planners, would amount to $34,000 in fiscal 1957—small indeed in light of a $44,000,000 health program.

Obviously, the planners had little conception of the nature of dental care or of the dental problems of those the project was designed to serve; therefore, they could not foresee the difficulties that were bound to arise once the plan was put into effect.

Immediately on the publication of Medicare regulations, the Association instituted a continuing series of conferences with the Office of Dependents' Medical Care calling attention to the problems inherent in the administration of the dental phase of the project. The Office of Dependents' Medical Care, recognizing the soundness of the Association's contention, instituted steps to correct the situation. At the request of that office, the Department of Defense authorized the appointment of a dental advisory committee to confer with the executive director of the Office of Dependents' Medical Care. The committee will include three members nominated by the Association: John P. Looby, C. E. Rutledge and Rudolph H. Friedrich.

Now that an immediate source of dental advice and assistance has been made available to those in charge of the Medicare program, it is hoped that much of the existing confusion will soon disappear. Certainly much of it could have been avoided if such advice and assistance had been utilized in the initial planning.

Court rules in favor of Association in libel suit filed by antifluoridationist

"The American Dental Association apparently feels that the cause which their membership stands for or endorses is a good one; they feel that it is a matter of public concern; they feel that the general public should be told who are some of the men who are opposing their line of thought, and it is a good public service because some of the individuals who have been exposed certainly would suggest that they are not the right type of people to stand side by side for a matter which might be for the benefit of the general public. . . . My decision is that a judgment of dismissal with prejudice will be entered in favor of the defendants."

So stated Judge Edward V. Martino, of the Superior Court of New Jersey, at Camden, May 22, in dismissing a libel suit for $200,000 damages filed by Robert J. H. Mick against the American Dental Association, Lon W. Morrey, the Association's editor, and Herbert B. Bain, director of the Association's Bureau of Public Information. The court's ruling to dismiss the suit came on the motion of defendants at the close of the plaintiff's case.

Dr. Mick, a dentist and an opponent of water fluoridation, had alleged that the plaintiffs had libeled him for his views.

The court in its review of the facts observed that in December 1954, while the plaintiff was stationed with the U. S. Army in Stuttgart, Germany, he had asked a fellow officer to write a letter to the American Dental Association asking for information on Dr. Mick. Mr. Bain, in answer, wrote that Dr. Mick was a member in good standing of the Association, that he was on duty with the Armed Forces, and that the Association was in total disagreement with Dr. Mick's views relating to fluoridation, believing those views "to be based on complete misinformation and to be totally irresponsible."

"The writer of the letter, speaking for the defendant, American Dental Association, was merely expressing an opinion to another dentist from whom he had received a request concerning a fellow dentist, and the communication, in my opinion, was more or less privileged," stated the court. "Certainly, the letter did not indicate any malice. There is no testimony in this case, incidentally, which would suggest malice existing between this plaintiff and these defendants.

"This court, of course, is not deciding the question of whether fluoridation is good or bad. That is not the question before the court. That is a matter which the professional men interested in that particular phase must decide for the good and welfare of the country, generally. . . . My conclusion . . . is that the letter contains merely an opinion sent to a person who had a right to know; no malice; nothing derogatory to Dr. Mick's professional status or ability was quoted or set forth in that letter. It was merely a disagreement with the view that Dr. Mick

has. Certainly, we in America haven't lost that privilege yet. To comment upon a person's views is certainly not libelous. . . . If it were, the courts would be loaded with suits of this type.

"It appears from some publications which were introduced into evidence that over a period of time there have appeared articles in which certain people who espouse the cause against fluoridation were investigated, and their background set forth in those particular publications. Now, these men have been named. There has been no attempt upon the Dental Association to make general statements about individuals, excepting where they list the general statement as to the type of people who have been known to espouse anti-fluoridation sentiment. . . . In none of these articles was this plaintiff referred to directly or even indirectly . . . excepting that he has seen fit to conclude that one of the various paragraphs must have been meant to apply to him. I feel that is stretching the imagination too far. . . .

"I can't see how any of the comments in any of these publications can be said to be actionable as far as this plaintiff is concerned. It is my firm conviction that the plaintiff has not as a matter of law supplied those facts which would justify a jury deliberating on the question of damages. . . . My decision is a judgment of dismissal with prejudice will be entered in favor of the defendants."

The presentation of Dr. Mick's case took two and a half days. In addition to Dr. Mick, witnesses for the plaintiff included three physicians—Dr. George L. Waldbott, of Detroit; Dr. Max S. Rohde, of New York, and Dr. Jonathan Forman, of Columbus, Ohio—all of whom testified that they agreed with Dr. Mick's views opposing water fluoridation. The jury selected to hear the case was automatically dismissed when the case was thrown out of court. The Association was defended by Anthony M. Lario, a Camden, N. J. attorney.

International Correspondence

NEWS FROM GREAT BRITAIN

As a result of a long debate in Parliament on March 8, the members agreed:

"That this House notes with concern the shortage of dentists, and calls upon Her Majesty's Government to hasten their consideration of the recommendations of the McNair Committee on recruitment; to encourage the proper training and employment of ancillary dental workers; and to further the development of measures to prevent dental decay."

The British Dental Association now is waiting for the Ministry of Health to set up an independent committee, as recommended in the McNair Report, to study the question of dental health education of the general public.

HEALTH OF A SCHOOL CHILD

A recently published report entitled "The Health of the School Child" by the Chief Medical Officer of the Ministry of Education for the years 1954-55 extends the story of health services rendered British and Welsh school children by the School Health Service since 1907. The current year, in fact, marks the close of a half-century of such services under local education authorities, during which enormous strides have been made.

Throughout this period, however, the School Dental Service has experienced continued difficulties in securing sufficient personnel and in maintaining adequate preventive control and treatment programs. The staffing disasters which occurred soon after 1948 are being somewhat corrected, but the large increase in school population since the war presents the problem of providing additional personnel.

According to the report, the total equivalent of whole-time dental officers in England and Wales was slightly more than 1,000 at the end of 1955, a milestone in history. The report pays tribute to the valuable services rendered by part-time dental officers and also mentions the importance of the McNair Committee on recruitment to the profession.

In commenting on the Dentists' Act of 1956, the report points out that ancillaries in a public dental service will work under the direction of a registered dentist who will be responsible for the examination and the planning of treatment.

In discussing the understaffing of the School Dental Service, the report recommends that the present ratio of one dental officer to 6,500 children in England and Wales be cut in half, that is, to one dentist for every 3,000 children. Agreement probably never will be reached about the number of children for whom a school dentist can provide satisfactory service in a given year, but experience has proved that with a fair amount of help from the general dental service in a given area, a reasonable standard of dental health can be achieved with a ratio of one dentist to 3,000 children. Such an inference, however, only can be drawn where authorities make adequate arrangements for treatment of the protracted forms of orthodontic defects which make serious inroads on the time of the school dentist.

The report also comments on the problems associated with the care of deciduous teeth. Saving the deciduous dentition of the child population of this country presents such a vast problem that official caution undoubtedly is warranted under existing circumstances. Many recent dental graduates often find it difficult to examine the whole dentition of a child and estimate its future development needs. Refresher courses and additional qualifications in children's dentistry would be valuable in this connection.

The report makes reference to the increase in the incidence of caries caused by the overindulgence in sweets and it concludes by emphasizing that good surgery accommodations and equipment will increase operating efficiency and also attract more and better candidates to the service.

INTERNATIONAL DENTAL CONGRESS

The representatives of the British Dental Association at the General Assembly for the International Dental Congress to be held in Rome in September are: delegates—J. W. Gilbert; W. Peebles; W. Stewart Ross; alternates—J. Aitchison; W. R. Cleverley; R. O. Walker; observer—Seymour Robinson.

In conjunction with the Congress, a 20-minute color film on dental hygiene is being produced by Messrs. Gibbs and Co. Designed especially for children, the film is entitled "A Tooth in Time." A similar film entitled "Let's Keep our Teeth" was produced by this firm for the International Dental Congress held in London in 1952.

NATIONAL HEALTH SERVICE

As a result of appeals by the medical and dental professions on the question of increased remuneration in the National Health Service, the government has set up a royal commission under the chairmanship of Sir Harry Pilkington to consider:

1. How professional remuneration now received by physicians and dentists in the National Health Service compares with the remuneration received by members of other professions, by other members of the medical and dental professions and by people engaged in associated occupations.

2. What the proper current level of remuneration should be for physicians and dentists serving in the National Health Service.

3. Whether, and if so what, arrangements should be made to keep that remuneration under review, and to make recommendations for future adjustments.

Meanwhile, regulations authorizing an increase of 5 per cent in the remuneration of senior physicians and dentists in hospitals and of dentists in the General Dental Service became effective May 1. These regulations implement the promise of an interim adjustment which was given by the Prime Minister in the House of Commons. Dentists taking part in the General Dental Service will receive an average increase of 5 per cent on their net incomes. As operating expenses must be taken into account, the actual increase will be 2.6 per cent on gross income—the percentage mentioned in the regulations.

More than 10,000 senior hospital physicians and dentists, about 21,000 family physicians and about 11,000 dentists in Great Britain will be affected by the increase. The estimated cost of the two interim adjustments for Great Britain is nearly six million pounds per annum.

A booklet which reviews the health services in Britain has been completed by the Central Office of Information of the National Health Service. Intended to give general information without going into detail, it states that the services established in July, 1948, now are used by 97 per cent of the population and that the costs amount to 3 per cent of the total national resources.

MINISTRY OF EDUCATION

The Ministry recently issued a useful pamphlet on health education. Although it contains little on the subject of teeth, it does discourage the use of sticky sugary foods, stating that "few children are naturally interested in their teeth; there is nothing in a child's own experience to suggest that neglect may have serious consequences or that good dental habits are worthwhile. The first step, therefore, will be to persuade children to take interest and pride in their teeth."

ITEMS OF INTEREST

The Committee on Radiological Hazards to Patients has sent a questionnaire to all dental practitioners in Great Britain which, when returned, will provide some valuable information. The investigation covers a seven-day period and states that "no criticism of dental radiological practice is implied by the survey and it is important that radiological examinations are carried out exactly as in normal times."

The Howard Mummery Prize, presented every three years by the British Dental Association for outstanding research work, has been awarded to J. J. Hodson of Sheffield.

The membership of the British Dental Association as of May 3 is 10,870.

A. O. Chick, M.D.S., has been appointed to the university chair of dental prosthetics at the School of Dental Surgery, Royal Dental Hospital, London.

E. D. Farmer, M.A., M.D.S., F.D.S., has been appointed to the Louis Cohen Chair of Dental Surgery which will become vacant upon the retirement of Prof. Stones. Mr. Farmer is president-elect of the British Society of Periodontology.

G. H. Leatherman,
D.M.D., F.D.S., R.C.S., F.A.C.D.

Association Affairs

FORUM ON COMPLETE DENTURES TO HIGHLIGHT ESSAY PROGRAM

Seven nationally known essayists will present a full-day comprehensive forum on complete denture construction at the 98th annual session of the American Dental Association in November.

Topics to be covered at the Wednesday, Nov. 6, meeting include diagnosis, impressions, occlusal records, posterior occlusion, esthetics and postinsertion problems. Presiding officer of the session will be Vincent Trapozzano and Charles H. Jamieson, Detroit, will serve as moderator. Panelists will include Victor O. Lucia, Teaneck, N. J.; Harold L. Harris, Denver; O. M. Dresen, Milwaukee; S. Howard Payne, Buffalo, N. Y.; Roland Fisher, Glendale, Calif.; and Raymond Nagle, New York.

The forum style to be used at this year's session is patterned after the refresher course format. This method, an innovation for the scientific sessions, will provide an opportunity for broader presentation of the subjects. Three one and two-day forums and 14 half-day panels will be presented at the Miami meeting. Projected clinics, table clinics, motion pictures and exhibits will round out this year's program.

Another "first" on the program will be a slide and motion picture clinic to be held all day Wednesday. Objective of this clinic is to demonstrate for dentists and dental schools interested in producing films and slides the most efficient, effective and economical methods of production.

Topics for this clinic will include practical application of photography in the dental office, preplanning and script preparation of motion pictures for the dental profession and for the public, and magnetic sound versus optical sound.

Moderators for the morning and afternoon sessions will be Rene Rochon, dean, University of Detroit School of Dentistry and Eduard Friedrich, Chicago, respectively. Participants will include John Carr, Indianapolis, Ind.; William Rakower, New York; Forrest R. Slavens, Steamboat Springs, Colo., and James Rothenberger, Minneapolis.

Scheduled for Tuesday morning is a panel discussion on interpretation of roentgenograms in general practice. Presiding will be Donald T. Waggener. LeRoy M. Ennis, Philadelphia, has been selected to moderate the discussion. The panel will discuss common errors in roentgenographic interpretation of carious lesions, periodontal lesions, periapical lesions and normal landmarks. Panelists will include Arthur H. Wuehrmann, Birmingham, Ala.; Beryl T. Ritchey, Colorado Springs, Colo.; Ralph F. Sommer, Mackinac Island, Mich., and William J. Updegrave, Philadelphia.

Dentistry in 1967 will be discussed at Monday afternoon's meeting by B. Duane Moen, Chicago; R. H. Friedrich, Chicago; George C. Paffenbarger, Washington, D. C. and Shailer Peterson, Chicago. Subjects will include population growth and dental manpower, dental practice during the next ten years, scientific developments in dentistry and future trends in dental education. Harry Lyons will moderate the panel discussion and Rulon W. Openshaw will preside as chairman of the meeting.

MEETING STRESSES COMPLEX TASKS OF STATE SOCIETY

Executive secretaries and officers of 34 constituent societies attended the Ninth State Secretaries' Management Conference at the Central Office on June 10-12 to discuss the role of councils or committees and officers in the development of policies in constituent societies, dental laboratory problems, legal hazards for constituent societies and special problems.

Harold Hillenbrand, secretary of the Association, gave the keynote address and was followed by Rudolph H. Friedrich, secretary, Council on Dental Health, and D. C. Trexler, director, institutes and short courses, University of Mississippi, who spoke on various aspects of the roles of councils and committees.

The role of the officers was presented by Henry E. Colby, past president, Minnesota State Dental Association; Harold E. Tingley, secretary, Massachusetts Dental Society and James Robinson, executive secretary, Southern California State Dental Association.

Problems of the dental laboratory opened the June 11 session. Participants were Bernard J. Beazley, secretary, Council on Dental Trade and Laboratory Relations; Andrew M. Cunningham, executive secretary, North Carolina Dental Society; Shailer Peterson, secretary, Council on Dental Education; Joseph L. Champagne, secretary, Michigan Board of Chemistry and Paul W. Clopper, secretary, Illinois State Dental Society.

The afternoon session enabled conference participants to join in an open forum on the legal hazards for constituent societies.

Special problems of constituent societies were discussed at the closing session by Bernard J. Conway, secretary, Judicial Council; Herbert B. Bain, director, Bureau of Public Information; B. Duane Moen, director, Bureau of Economic Research and Statistics; Ray Cobaugh, executive secretary, Pennsylvania State Dental Society; John E. Rush, assistant business manager of the Association, and Sholom Pearlman, assistant secretary, Council on Dental Therapeutics.

A detailed summary of the major points discussed will be presented in the August issue of THE JOURNAL.

Next year's conference will be held on June 9-11, Louis M. Cruttenden, Association assistant secretary, announced.

HERBERT C. LASSITER TO SERVE TWO COUNCILS

Herbert C. Lassiter of Oak Lawn, Ill., has been appointed secretary of the Council on Federal Dental Services and secretary of the Council on Insurance, Harold Hillenbrand, Association secretary, announces. Bernard J. Beazley, who had been serving as secretary of the Council on Federal Dental Services, will devote full time to his position as secretary of the Council on Dental Trade and Laboratory Relations.

Prior to his appointment, Mr. Lassiter was a member of the law firm of McNamara, Voigt, Greene & Nordstrand, with offices in Chicago. He attended the University of Washington and Loyola University, Chicago, from which he was graduated in 1951 with an LL.B. degree. In 1945-46 he had served in the SeaBee branch of the U. S. Navy.

APPOINTMENTS TO MEDICARE DENTAL ADVISORY GROUP MADE

Maj. Gen. Paul I. Robinson, director of the Armed Forces Dependents' Medical Program (Medicare) announced the appointment of the dental advisory committee to his office. This group will study and make recommendations on the administration of dental benefits under the Medicare program as presently established.

Members of the committee and their affiliations are as follows: *Army*—Lt. Col.

Robert W. Hobson, who will serve as executive secretary, Lt. Col. Steve G. Davis and Lt. Col. Karl F. Ehrlich; *Navy*—Lt. Cmdr. P. E. Rickey, Capt. Guy E. Stahr and Capt. Arthur R. Frechette; *Air Force*—Lt. Col. D. W. Pratt, Brig. Gen. James S. Cathroe and Col. Charles S. O'Grady (alternate); *U. S. Public Health Service*—Leland E. Weyer and Murray A. Diamond; alternates Thomas L. Hagan and Robert Johnston; *American Dental Association*—John P. Looby, member, Council on Hospital Dental Service; C. E. Rutledge, chairman, Judicial Council and Rudolph H. Friedrich, secretary, Council on Dental Health; *Blue Shield Medical Care Plans*—John W. Castellucci; *Health Insurance Association of America*—J. F. Follmann, Jr.

The initial meeting of this committee will be held in the Main Navy Building, Washington, D. C., on July 8.

DENTAL STORY IN "LIFE" PROTESTED BY ASSOCIATION

The American Dental Association has protested an article on a dental handpiece that appeared in the May 20 issue of *Life* magazine. The six-page illustrated article, entitled "A Drill that Goes Faster and Lessens Dental Pain," was devoted almost entirely to the Page-Chayes high-speed handpiece, which was described as "superior to any piece of new dental equipment," and to its inventor, Richard W. Page, of Chappaqua, N. Y.

The Association's Bureau of Public Information, in a letter to the editor of *Life*, asserted that the article had evoked protest from members of the dental profession. The Bureau said: "In the opinion of staff scientists of the American Dental Association, the emphasis on one instrument presents a misleading and distorted picture; moreover, it largely overlooks the wide-scale development and use of other new equipment designed to minimize the vibration and discomfort associated with the dental drill. While much of the greatly increased research in dentistry today is concerned with preventive procedures to reduce the very large rate of dental disease, oral rehabilitation, including treatment of dental cavities, is still a major part of dentistry. . . . To give an erroneous impression regarding the availability and superiority of any particular instrument for this important aspect of treatment can serve only to mislead the public—a most unfortunate development in view of some excellent articles on dentistry that have appeared previously in *Life*."

FINAL REVISION PLANS MADE FOR "DENTAL REMEDIES"

At a meeting held on June 14 and 15 at the Central Office, the Council on Dental Therapeutics concluded its plans for the complete revision of its publication *Accepted Dental Remedies*. Scheduled for release on January 1, 1958, the new edition will contain additional chapters including one on the significance to the dentist of drugs employed by the physician in treating a patient.

In addition, each chapter will be revised thoroughly and obsolete material will be deleted. The method of presenting the material also will be changed.

ILLUSTRATIONS ARE SOUGHT FOR ASSOCIATION HISTORY

Illustrations of places where early meetings of the American Dental Association were held, and other illustrations pertaining to the history and development of organized dentistry, are being sought by the committee in charge of preparing a history of the Association.

Persons having such illustrations, or knowing of their whereabouts, are asked to write Lon W. Morrey, Association editor, 222 E. Superior St., Chicago 11.

The text of the history is nearly com-

plete. Publication is planned for early 1959, the centennial year. Several good photographs of delegates in attendance at early meetings and of the meeting sites have been obtained but more are wanted to make the pictorial section of the history as complete as possible.

OLGA O. NORBERG HONORED ON RETIREMENT FROM A.D.A.

Miss Olga O. Norberg, administrative assistant to the staff of the Council on Legislation, retired June 1 after 26 years with the Association. Miss Norberg was tendered a farewell party by fellow staff workers May 29 in the Central Office. She was presented with a framed Utrillo print and a leather-bound memory book containing farewell inscriptions by members of the Central Office staff and letters of appreciation from trustees and present and past officers of the Association. Refreshments were served and brief talks were given by Harold Hillenbrand, secretary, and Lon W. Morrey, editor, of the Association.

Miss Norberg had worked for the Association since 1931 and had served for many years as secretary to Harry P. Pinney, secretary of the Association from 1927 to 1946.

NATIONAL RESEARCH COUNCIL REAPPOINTS TRENDLEY DEAN

H. Trendley Dean, secretary of the Association's Council on Dental Research, has been reappointed a member of the National Academy of Sciences' National Research Council, Detlev W. Bronk, academy president, announces. Dr. Dean will represent the American Dental Association in the division of medical sciences for a three year period beginning July 1, 1957.

The National Research Council was established by an Act of Congress in 1863, in President Lincoln's administration, to serve as a general clearinghouse of information on research work undertaken throughout the country. Not a governmental agency, the Council is supported largely by foundations. It advises the federal government on research matters, and works with various research groups.

Dr. Dean, an epidemiologist, has served on the Council from 1943-48, and from 1953 to the present. He was an officer for many years in the U. S. Public Health Service and is a former director of the National Institute of Dental Research.

C. W. CAMALIER APPOINTED TO YOUTH ADVISORY COMMITTEE

C. Willard Camalier, assistant secretary of the American Dental Association, recently was selected by Dwight D. Eisenhower to serve on the President's Citizens Advisory Committee on the Fitness of American Youth. Composed of 120 outstanding citizens, this committee will work with the President's Council on Youth Fitness by considering and evaluating existing and prospective governmental and private measures conducive to the achievement of a happier, healthier and more completely fit American youth.

The first joint meeting of the committee and council will be held at the U. S. Military Academy on September 9 and 10 and will be presided over by Vice-President Nixon.

INITIATE DENTAL HYGIENE APTITUDE TESTING PROGRAM

The American Dental Hygienists' Association announces the inauguration of the Dental Hygiene Aptitude Testing Program. This program has been developed with the guidance of the Council on Dental Education of the American Dental Association, and will serve to implement the criteria now used in the selection of qualified students for dental hygiene education.

The testing periods for applicants for the class of 1958 will be October 11-12, 1957 and April 11-12, 1958.

Brochures outlining the program are available from the American Dental Hygienists' Association, 1735 Eye St., N.W., Washington 6, D. C.

Legislation

SENATE COMMITTEE APPROVES DRAFT LAW AMENDMENTS

J. Claude Earnest, chairman of the American Dental Association Council on Legislation, testified before the Committee on Armed Services of the U. S. Senate on June 6 in behalf of House Bill H.R. 6548.

This bill repeals the Doctor Draft Act by relieving physicians and dentists of a double liability to serve in the Armed Forces. The original Act provided the selective service with authority to draft doctors up to the age of 46. Thus a dentist faced a liability as a citizen between the ages of 18 and 35 and as a dentist up to the age of 46.

For the past two years, this authority has not been needed since there are a sufficient number of graduates from medical and dental schools to fill the needs of the armed services.

H.R. 6548 also retains the services of the National Advisory Committee to the Selective Service. This committee, which functions on the national, state and local levels, insures that the community and individual members of the profession are equitably treated in the application of the draft law.

The bill as presented to the Armed Forces Committee was passed without modification. The Senate enacted the bill on June 12, and it will become effective as of July 1 upon signature by the president.

DENTAL LABORATORY RULES AMENDED JUNE 14 BY FTC

The Federal Trade Commission on June 14 promulgated its amended *Rules* for the Commercial Dental Laboratory Industry.

The amendments remove the words "design" and "occlusion" from the *Rules;* have the effect of extending the jurisdiction of the *Rules* to include unethical as well as the ethical segment of the dental laboratory industry, and eliminate certain technical language which dealt with advertising or promotional allowances and discriminatory services which the American Dental Association had contended had "no meaningful application to transactions to which a dentist is a party." The Commission did not act on the Association's request that the *Rules* clearly define the adjunctive relationship between dentists and technicians as established by state laws.

The amended *Rules* will become effective within 30 days and will supersede the original Rules which were promulgated November 4, 1955.

The Board of Trustees of the Association will hold a special meeting July 13 in the Central Office to review the Commission's action. The meeting was called by Harry Lyons, Association president, in accordance with a directive from the House of Delegates. The Association's Council on Dental Trade and Laboratory Relations will report its recommendations on the amended *Rules* to the Board.

In a statement issued June 14 the Commission said:

"After full consideration of all views and information submitted relative to the proposed amendments and deletions, the Commission directed that the word 'design' be deleted from the definition of the industry and specifically found and states that the purpose of the definition of the industry preceding trade practice rules is solely to identify individuals and concerns whose practices are subject to the rules,

and that it is not necessary to include the word 'design' in the definition of the industry for that purpose. The Commission directed that the words 'design' and 'occlusion' be eliminated from Rule 1 and the term 'design' from Rule 2, for the reason that in the Commission's opinion these words are not necessary to the adequacy of the rules or to the accomplishment of the Commission's purpose in the promulgation of them. The Commission states that the above action does not constitute a decision by it as to the specific functions in these two respects, which are performed by industry members covered by the Rules. The Commission further directs that Sections III and IV of Rule 12 be deleted for the reason that there has been shown no need for the inclusion of these sections; and that the request for deletion of Rule 13 be denied for the reason that the same is in proper form and supplies needed rule coverage."

History of Rules • Early in 1954 the National Association of Dental Laboratories had formally requested the FTC to promulgate trade practice rules for the industry. At a trade practice conference on this matter in September 1954 the American Dental Association representatives had recommended that the proposed *Rules* accurately describe the function of the dental laboratories and the relation of the dental laboratories to the dental profession.

In June 1955 Association representatives testified at a public hearing held by the FTC, and recommended that language in the preliminary draft of the *Rules* which indicated that the dental laboratories are responsible for the design, appearance, comfort, occlusion and fit of a prosthetic or orthodontic appliance be eliminated. The representatives also recommended that the *Rules* describe the proper relation of the dental laboratory to the dentist by declaring that only licensed dental practitioners and other persons authorized by state law may lawfully deal with dental laboratories.

On November 4, 1955, the FTC promulgated the *Rules*. They were not acceptable to the Association since they were not fully responsive to the recommendations which the Association had made. On April 3, 1956, the Association's Board of Trustees directed the Council on Dental Trade and Laboratory Relations to seek amendment of the *Rules* and to consider making appropriate recommendations on the possibility of revoking or enjoining the *Rules* if satisfactory amendment was not achieved prior to the 1956 annual session.

The House of Delegates at the October 1956 meeting in Atlantic City directed the Council on Dental Trade and Laboratory Relations, at the hearing to be convened by the FTC on the reconsideration of the *Rules*, to seek amendment with particular regard to the terms "design" and "occlusion" and to obtain a clear statement defining the adjunctive relation of the dental laboratory craft to the dental profession.

The House of Delegates further directed the Board to convene a special session to review the FTC decision as soon as it was rendered.

SENATE APPROPRIATES FUNDS FOR DENTAL HEALTH PROGRAM

A bill containing an appropriation of $6,430,000 to support the dental activities of the U. S. Public Health Service was enacted by the Senate on June 12. Included in this bill is an amendment inserted by the Senate Appropriations Committee which makes the $200,000 voted by Congress last year for the planning of a building to house the National Institute of Dental Research available during fiscal 1958. Without this amendment, these funds could not have been obligated beyond June 30, 1957. However, the funds recommended by the American Dental

Association, and previously authorized by Congress, for the construction of the NIDR building were not included in the bill.

Funds appropriated for dental health and research activities during the fiscal year beginning July 1, 1957, represent an increase of more than $400,000 over last year's appropriations. Of this increase, $250,000 is to be allocated to the research grant program. The Senate version for the over-all bill, which includes appropriations for labor, health, education and welfare activities, was more than 38 million dollars in excess of the amount voted by the House. Funds for the dental health service activities, however, are the same in both versions.

V.A. SUBCOMMITTEE STUDIES A.D.A. RECOMMENDATIONS

On June 12, C. Willard Camalier, assistant secretary of the American Dental Association, testified before a subcommittee of the House Veterans Affairs Committee on a bill that would provide certain adjustments in organization and an increase in salary levels in the Department of Medicine and Surgery of the Veterans Administration.

This bill, H.R. 6719, was introduced into the House by George S. Long (D., La.) a dentist. If passed, the bill would provide three important modifications to the present law. First, it would reduce from eight to five the number of assistant chief medical directors, retaining, however, the basic proviso of the present statute which requires that one assistant chief medical director be a dentist responsible to the chief medical director for the operation of the dental service. Second, the bill would provide for a new administrative echelon—that of deputy assistant chief medical director, 15 of which are authorized by the bill. Third, H.R. 6719 calls for an increase in the pay range of dental and medical personnel employed by the V.A., although reducing the salary increment now authorized to dentists and physicians who are specialists.

In testifying for the Association, Dr. Camalier posed no objection to the first two measures so long as the basic statutory proviso with respect to the V.A. dental chief is not modified. He further stated that the Association favors the salary increases authorized by the bill because it would place V.A. salaries on a closer parity with those offered by the armed services and income resulting from private practice. However, Dr. Camalier questioned that portion of the bill which would reduce the 25 per cent salary increment granted a specialist. As dental specialists earn on the average of at least 36 per cent more than general practitioners, Dr. Camalier suggested that a reduction in V.A. specialist salary increment from 25 to 10 per cent might not be a positive influence in attracting and retaining dental and medical specialists.

FLORIDA LEGISLATURE ENACTS STRICTER DENTAL LAWS

On May 29, the governor of Florida signed Senate Bill 432 which contains the following important amendments to the Florida Dental Practice Law of 1955:

Registration of dental laboratories—Every dental laboratory must have documentary evidence of registration with the board of dental examiners.

Issuance of conditional renewal certificates—Five years after the effective date of this act, any dentist whose application indicates that he has not actively practiced dentistry or that he has not been engaged in teaching dentistry in the state of Florida for the preceding five years shall be issued a conditional renewal certificate. No annual renewal certificate shall be issued to the holder of a conditional renewal certificate until such

holder shall have demonstrated to the board that he has maintained such professional skills and moral character as were required upon his being licensed in this state.

Imposition of sterner penalties—According to the new law, the sale of forged or invalid certificates and the failure of a dentist to issue, in duplicate, written prescriptions for certain types of services by unlicensed persons are now classified as felonies rather than misdemeanors.

TENNESSEE DENTAL ACT UPHELD BY STATE COURT

The Tennessee Supreme Court on June 7 held valid the state's Dental Practice Act of 1935 which, on October 3, 1956, had been ruled unconstitutional by Chancellor J. Clifford Curry, of Chattanooga.

During the period that this appeal to the Supreme Court was pending, the Tennessee legislature enacted the revised Dental Practice Act of 1957 sponsored by the Tennessee State Dental Association. The new act more precisely defines the adjunctive relation of the dental laboratory craft to the dental profession; penalties for violation of the act were increased at least tenfold over those of the former statute.

By its ruling the Supreme Court reinstated an injunction the Tennessee Board of Dental Examiners had obtained to restrain Clarence E. Rymer, 61 year old Chattanooga dental technician, from engaging in the practice of dentistry. The Supreme Court declared that the State Board of Dental Examiners and State Licensing Board for the Healing Arts had not sought to prevent Rymer from operating a dental laboratory but only to prohibit him from engaging in the practice of dentistry. Rymer made no defense before the Supreme Court and failed to file a brief.

Violation of injunctive proceedings under Tennessee's 1957 Dental Practice Act is a felony. Conviction carries a fine of from $1,000 to $2,000 and imprisonment for at least one year.

NEW YORK PROPOSAL WOULD REGULATE ROENTGENOTHERAPY

A proposed new regulation in the New York Sanitary Code would provide that radiation shall be applied to parts of the human body only by persons licensed to diagnose and treat such parts of the human body. The proposal would restrict the sale, lease, transfer or loan of roentgen-ray or fluoroscopic equipment to persons engaged in an occupation where use of such equipment is permitted. Only persons licensed to practice dentistry, medicine, podiatry and osteopathy, and technicians and nurses authorized by them, would be permitted to apply radiation to human beings.

Attorney General Louis J. Lefkowitz of the State of New York has advised the State Commissioner of Health that the regulation promulgated by the Public Health Council is constitutional. "The danger to health and life itself in the application of radiation to human beings by persons untrained in the treatment of the parts of the human body to which the radiation is to be applied, seems to me to be self-evident," said the Attorney General.

28 STATES PROVIDE FOR WRITTEN AUTHORIZATIONS

Written authorizations for work delegated to commercial dental laboratories in Pennsylvania are provided for in a measure that has been signed by the governor after approval by the state legislature. The action brings to 28 the number of state dental practice acts now providing for such written work authorizations. The other 27 states are: Arizona, Arkansas, California, Colorado, Con-

necticut, District of Columbia, Florida, Idaho, Kansas, Maine, Massachusetts, Minnesota, Missouri, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, Ohio, Oregon, Rhode Island, South Dakota, Washington, West Virginia and Wisconsin.

In South Carolina a bill that would provide for work authorizations has been passed by the lower house of the state legislature. The North Carolina state legislature has approved a series of amendments designed to strengthen the state dental practice act. Included are a more precise definition of dental prosthetic services, and a grant of authority to the state board of dental examiners to apply to the courts for an injunction against illegal practitioners.

Dental Societies

DENTIST'S WIFE WILLS MAINE SOCIETY $50,000

A bequest of more than $50,000 in cash and securities was made to the Maine Dental Society in the will of the late Mrs. Jennie Redlon of Waldaboro, Maine. Mrs. Redlon was the widow of Francis Redlon, an American Dental Association life member. The funds are to be used to aid needy dentists and their widows. Mrs. Redlon's will, filed for probate in February, provided for small bequests of jewelry and other personal property to several distant relatives and directed that the bulk of her estate go to the Maine Dental Society.

The U. S. Naval Station, Newport, R. I., recently held an open house in conjunction with the quarterly meeting of the Rhode Island State Dental Association. Among those who attended are (l. to r.) A. L. Midgley, past president, Rhode Island State Dental Association; A. W. Easton, Trustee, First District, American Dental Association; Capt. E. J. Holubek, U. S. Naval Station, Newport; F. S. Harold, president, Connecticut State Dental Association; B. C. Friedman, president, R.I.S.D.A.; W. D. MacIntosh, president-elect, R.I.S.D.A.; Rear Admiral C. C. DeFord, inspector, naval dental activities, Atlantic Coast and Capt. H. J. A. MacInnis, district dental officer, First Naval District, Boston.

KING AND QUEEN OF SMILE SELECTED IN OKLAHOMA

Fourteen finalists were selected from over 50,000 junior high school students in seven Oklahoma districts to participate in the final judging for the "Smile of the Year" program. Examined during the preliminaries by dentists for perfect teeth (including proper dental restoration), the finalists were judged by a panel of lay people on the basis of personality, poise, alertness and facial contour.

At the awards banquet on February 8, Joan Fetzer, Woodward, Okla., and Jay Brummett, Duncan, Okla., were crowned queen and king of the program. Their majesties were awarded wrist watches and the rotating trophies. All finalists received plaques from their respective districts and honorary colonelships in the state of Oklahoma. The king and queen were appointed honorary semicentennial commissions on Governor Raymond Gary's staff and acted as emissaries of good will during Oklahoma's fiftieth anniversary celebration in June. They appeared in Teen Town, U.S.A., a building depicting modern teen-agers in their environment.

The success of the "Smile of the Year" program, adopted by the Oklahoma State Dental Association in 1955, is reflected in the inquiries received from throughout the world. The French Dental Association already has adopted this program, and this year the Mexican Dental Association sent a representative to observe the final judging. Blueprints of the program have been submitted to the Aus-

Governor Raymond Gary, "Queen" Joan Fetzer and "King" Jay Brummett

William R. Alstadt, president-elect of the American Dental Association, receives commission of Kentucky Colonel on the staff of Governor A. B. "Happy" Chandler during annual meeting of the American Society of Orthodontists in New Orleans. Shown (l. to r.) with Dr. Alstadt are the five Kentucky dentists who witnessed presentation: W. M. Selden, C. C. Congleton, President-Elect Alstadt, G. H. Prewitt, L. E. Wagers and H. D. Wilder. Dr. Alstadt appeared on the program with Governor Chandler during the recent 97th annual session of the Kentucky Dental Association.

tralian Dental Association and to the Bureau of Dental Health Education of the American Dental Association.

WISCONSIN SOCIETY FORMS A DENTAL FOUNDATION

A Dental Foundation was incorporated in Wisconsin in June, after approval of the project by the House of Delegates of the Wisconsin State Dental Society. The purposes of the new foundation are designated as charitable, educational and scientific, and are sufficiently broad to permit the foundation to create, maintain or contribute to institutions, organizations and funds with similar purposes.

Dental science and public health are specifically enumerated; other projects consistent with the purposes of the foundation are not excluded.

Councilors and officers of the society and an elected representative from each component group will compose the Foundation's board of trustees. In addition, nondentists not to exceed ten in number may be elected to the board.

CHICAGO SOCIETY REPEATS ANNUAL $500 ESSAY AWARD

The Chicago Dental Society has announced it will again offer an annual prize of $500 for the most meritorious

essay of an original investigation containing new and significant material of value to dentistry. The author of the winning essay will be invited to present it at the ninety-third midwinter meeting of the Chicago Dental Society, February 2-5, 1958.

The competition is open to any member of the American Dental Association, a recognized foreign dental society, student or other person of scientific attainment affiliated with a recognized institution in the field of dentistry. Applications to enter the competition must be filed before Sepember 1, 1957, with the office of the society, 30 N. Michigan Ave., Chicago. Manuscripts of all essays must be received not later than October 1.

National Defense

WALTER REED OFFERS CIVIL DEFENSE COURSE TO DENTISTS

The American Dental Association has been asked to select four dentists to take part in a civil defense course offered by Walter Reed Army Medical Center in Washington, D.C., and by Brooke Army Medical Center in Fort Sam Houston, Texas. The invitation was extended by Maj. Gen. James M. Epperly, chief of the Army Dental Corps. The week-long program, dates to be announced, will deal with the medical care of mass casualties. It is the first time that the Association has been invited to participate in these programs.

Rear Admiral R. W. Malone, chief of the Navy Dental Division, welcomes (left) Capt. Harry J. Wunderlich to duty on his staff. Captain Wunderlich relieved (right) Capt. Collister M. Wheeler as head of the reserve branch when the latter was placed on the retired list. Captain Wunderlich has served on active duty as a reserve officer for almost 15 years. His last assignment was that of Dental Reserve Program Officer for the Ninth Naval District.

Dental Education

HARVARD OPENS POSTDOCTORAL DENTAL MEDICINE PROGRAM

Selection of five dental school graduates for the first postdoctoral three-year study program in dental medicine has been announced by Roy O. Greep, dean of the Harvard School of Dental Medicine.

Those named to participate in the program which begins next fall are: Charles R. Cushing, Bangor, Maine; Richard C. Grossman, Beverly Hills, Calif.; Leif B. Johannessen, Needham, Mass.; Herbert Wells, New Haven, Conn., and S. Jerome Zackin, Waterbury, Conn.

As postdoctoral students they will engage in a program involving patient care, teaching and research, especially designed to broaden their professional experience. The entire program will be under the immediate direction of Reidar F. Sognnaes, professor of oral pathology at Harvard, and will be conducted in collaboration with the basic science departments of the Harvard Medical School and with affiliated dental clinics at the Forsyth Dental Infirmary for Children, Children's Hospital and the Massachusetts General Hospital.

THREE-DAY ORAL SURGERY COURSE OFFERED IN TEXAS

Oral surgery for the general practitioner is the scope of a postgraduate refresher course to be offered by the University of Texas Dental Branch beginning September 25.

The teaching faculty will be composed of members of the university's department of surgery. Tuition for the course is $75.

Inquiries should be addressed to Sumter Arnim, director, Postgraduate School of Dentistry, the University of Texas Dental Branch, P.O. Box 20068, Houston 25, Texas.

PROSTHETICS SUMMER COURSE PLANNED BY STERLING-ROCK

A two-week summer school program, from August 12 to 24, in facial and surgical prosthetics is being offered by the Sterling-Rock Falls Prosthetic and Rehabilitation Center, a research and treatment foundation for patient care and for the education and training of dentists.

Additional information is available from A. C. Fonder, Sterling-Rock Falls Prosthetic and Rehabilitation Center, 303 W. 2nd St., Rock Falls, Ill.

OREGON SCHOOL OFFERS MASTER'S IN PEDODONTICS

A new graduate program in pedodontics leading to the Master's degree in dentistry has been established by the Dental School, University of Oregon, in Portland. The major field of study provides training in pedodontics through lectures, conferences and clinical experience in the connecting teaching hospital. A thesis based on investigative work is required. The minor field is completed by election of courses in basic science and social science.

PROSTHETIC DENTISTRY TOPIC OF CONFERENCE AT IOWA

Members of the dental profession will convene at the State University of Iowa, Iowa City, on September 25 to attend a three-day conference on prosthetic dentistry.

The conference will include a comprehensive course of instruction, complete with visual aids, on the construction of maxillary and mandibular dentures.

Letters of inquiry may be addressed to W. J. Simon, dean, College of Dentistry, State University of Iowa.

Officers of the American Dental Association student chapter of the University of Tennessee College of Dentistry are shown with the speakers who conducted a brief course on dental writing, research and journalism, May 27, arranged by the Tennessee State Dental Association. Above (l. to r.): Rush Peace, chapter vice-president; F. D. Ostrander, Ann Arbor, Mich.; Garland Cherry, junior class representative; George B. Denton, research consultant of the American Dental Association; Toof Boone, immediate past president, and Frank Ashley, chapter president. Below are shown some of the 400 students attending the one-day course. In addition to the instruction, students also received a set of editorial material supplied by the American Dental Association's Council on Journalism.

SHORT COURSES SCHEDULED FOR PRACTICING DENTISTS

Alabama: Thirty-seven refresher courses to be offered by the University of Alabama School of Dentistry in the 1957-58 academic year, are listed according to the months in which they will be given:

September: Office accounting and income tax guidance for the general practitioner; English for professional people; the use of drugs in dental practice, and practical root canal therapy.

October: Partial dental prosthesis; office management and psychology of dentist-patient relationship; insurance, investments and estate planning; oral pathology-oral medicine; dental materials, practical application and evaluation of newer advances and changing concepts, and effective speaking for professional people.

November: Oral rehabilitation; theory and practice of periodontics; histopathology of the periodontium; dental assisting, and emergency care in dental practice.

December: Laboratory technics, and practical roentgen-ray technic and interpretation.

January: High-speed technics in operative dentistry; treatment planning and

case presentation; immediate root canal therapy followed by apicoectomy, and the management of pain in dental practice.

February: Nutrition and dentistry; effective speaking for professional people (eight evenings during the month); English for professional people (16 sessions one evening per week); periodontology for the general practitioner; preventive orthodontics, and laboratory procedures in crown and bridge prosthesis for the general practitioner.

March: Occlusal adjustments; insurance, investments and estate planning; income tax guidance; applied maxillofacial anatomy, and practical exodontics.

April: Root canal therapy, and pedodontics for the general practitioner.

May: Complete denture prosthesis; management of infections in dental disease; surgical anatomy of the head and neck followed by etiology and diagnosis of pain of dental origin, and removable orthodontic appliance construction.

MAXILLOFACIAL SURGERY COURSE OFFERED AT ILLINOIS

A concentrated, full-time two-week course in oral and maxillofacial surgery will be offered September 16-27 by the University of Illinois College of Dentistry. The course will include such subjects as mouth preparation for dentures, surgical removal of fractured roots, treatment of cysts, apicoectomy, pharmacology and anesthesiology.

UNIVERSITY OF TEXAS OFFERS ENDODONTICS CLASS IN AUGUST

A four-day postgraduate course in endodontics will be offered from August 14 to 17 by the University of Texas Dental Branch under the direction of Martin Cattoni, professor of endodontics. F. D. Ostrander, professor of dentistry, University of Michigan School of Dentistry will be visiting lecturer and Frank B. Trice, assistant professor of endodontics, University of Texas Dental Branch, will participate in the course.

The course is designed to acquaint the general practitioner with the fundamental principles and practices of endodontics. Various technical aspects will be explained in lectures, visual aids, laboratory demonstrations and demonstrations on patients.

Attendance will be limited to 20. Tuition is $150 of which $50 must accompany the application. Applications cannot be accepted after July 15.

Further information may be obtained by writing to Sumter Arnim, director, Postgraduate School of Dentistry, the University of Texas Dental Branch, P.O. Box 20068, Houston 25, Texas.

International

REDUCED RAIL FARES OFFERED TO F.D.I. PARTICIPANTS

Participants in the Twelfth International Dental Congress of the Fédération Dentaire Internationale, to be held September 7-14 in Rome, will be granted a 20 per cent reduction on single and return journeys from all stations at the Italian frontier to Rome, and vice versa, the Italian State Railway has announced. A 40 per cent reduction will be granted exhibitors and technical personnel. Application forms for this reduction may be obtained from the secretary general of the Congress, Dr. Pio Lalli, Via Boezio 16, Rome.

The opening ceremony will take place at 10 A.M. September 7 in the Congress Palace, in the presence of the President of the Republic.

Congress members from the various countries will follow the scientific discussions by means of simultaneous transla-

tions in the five official languages of the Congress. Many demonstrations and operations will be transmitted by television.

A ladies' committee is planning to make the stay of the relatives of Congress members pleasant and instructive.

Public Health

PROBLEMS OF CLAIM PAYMENT EXPLORED AT CONFERENCE

Representatives of the Health Insurance Association of America and the American Dental Association met at the Central Office on June 20. The purpose of the conference was to explore the problems of payment to the dentist for services now covered by commercial health and accident insurance policies and to consider the development of pilot programs for insuring certain categories of dental care that are not universal in incidence but that may cause a burden to the individual.

SELECT QUALIFIED STUDENTS FOR RESEARCH TRAINING

A new Public Health Service research training program, established to help increase the numbers of medical, dental, biological and mental health researchers, will begin in September, according to Acting Surgeon General W. Palmer Dearing.

Outstanding students in 82 schools of medicine, dentistry and osteopathy will be nominated by their deans. The 140 selected will drop out of regular course work during the period of research training.

Participants will receive tuition plus a stipend of not over $3,200 annually and an allowance of $350 a year for each dependent.

DENTAL PILOT STUDY PLANNED BY PUBLIC HEALTH SERVICE

A four year pilot study of an entire community will be made to identify the problems and to develop solutions to the problems of making dental services available to the institutionalized and homebound chronically ill and aged persons, the Public Health Service announces. The study will be conducted in Kansas City, Mo., by the service's Division of Dental Public Health. The Kansas City Metropolitan Community will cooperate, and the University of Kansas City School of Dentistry will remodel an existing structure to provide space for the clinic.

There are more than five million chronically ill patients, according to Donald J. Galagan, assistant division chief. "They are the forgotten in dental care," he added. "The fact must be faced that many individuals will live for long periods of time with chronic, incapacitating illnesses."

A sample of the institutionalized and homebound chronically ill and aged population in the Kansas City metropolitan area will be studied from a standpoint of dental needs. A selected group of patients will be provided with dental service. One phase of the project will focus attention on the community potential for providing dental service and stimulating acceptance of responsibility and appropriate action on the part of community agencies.

FLUORIDATION TO START AT FORT SAM HOUSTON

Fluoridation of the water supply at Ft. Sam Houston, Texas, began the middle of June, Col. Henry F. Taylor has announced.

This was the first fluoridation of water on an Army post in the Fourth U. S. Army's five-state area embracing Texas, Arkansas, Louisiana, Oklahoma and New Mexico.

General

ALMA MATER, PROFESSION GIVE AWARDS TO OREN OLIVER

Oren A. Oliver, well known Nashville, Tenn., orthodontist and past president of the American Dental Association and of the Federation Dentaire Internationale, recently received two awards for his contributions to human welfare.

The first award, the T. Gibson Hobbs Award, was presented to Dr. Oliver at the Lynchburgh College Founder's Day Convocation. It is given by the college to its alumni for "achievements . . . that bring credit to the alma mater."

At the meeting of the American Association of Orthodontists in New Orleans in May, Dr. Oliver became the fifteenth recipient of the Albert H. Ketchum Award. Established in 1936, this award is presented for outstanding contributions to the art and science of orthodontics.

Dr. Oliver has served on programs of numerous state dental associations in the U. S. as well as in England, Holland, France and Mexico.

In addition, Dr. Oliver has written a textbook and has been co-editor of several orthodontic journals and has published over 95 scientific articles based on research in his field.

President-Elect William Alstadt, acting as official goodwill ambassador from Little Rock, Ark., conferred honorary citizenships on the state's two senators, William J. Fulbright and John McClellan, and Secretary of Defense, Charles Wilson. Present in Washington, D. C. when (right) President-Elect Alstadt conferred the honor on (center) Sen. McClellan was C. Willard Camalier, assistant secretary of the American Dental Association.

MAY 27 TESTIMONIAL DINNER HONORS CHARLES W. FREEMAN

Charles W. Freeman

Charles W. Freeman, professor of oral surgery and member of the faculty of Northwestern University Dental School for 45 years, and dean from 1938 to 1953, was honored by colleagues and friends at a dinner May 27. Dr. Freeman earned D.D.S. and M.S. degrees at Northwestern University. He joined the faculty of the Dental School in 1912. He worked as assistant to Thomas L. Gilmer, oral surgeon. He served in France for two years in a base hospital during World War I and continued an active member of the Reserve.

Dr. Freeman has served on many committees of the Chicago Dental Society. For five years he was editor of the *Bulletin* issued by that society, and was co-chairman of the program committee of the Chicago Centennial Dental Congress in 1933. For many years he was a member of the health committee of the Council of Social Agencies in Chicago and chairman of its dental health committee. He is a past president of the American Association of Dental Schools, a fellow of the American College of Dentists, an elected fellow of the Royal College of Surgeons of England, and an honorary member of the Swedish Dental Society and of the American Dental Society of Europe. During his administration Dean Freeman fostered a program of study for foreign students; since 1934 more than 490 students from 45 countries have attended the school.

Dr. Freeman's other affiliations include membership in the International Association for Dental Research, Sigma Xi, the Institute of Medicine of Chicago, Omicron Kappa Upsilon and Delta Sigma Delta.

Dr. and Mrs. Freeman live in Evanston, Ill., and have two sons practicing dentistry, Arthur G. Freeman of Evanston, and Robert S. Freeman of Denver.

Rep. John E. Fogarty (D., R.I.) receives gold key and membership in Omicron Kappa Upsilon, national honorary dental society, from (left) Clemens V. Rault, dean of the Georgetown University Dental School and (right) the Very Rev. Edward B. Bunn, S.J., president of the university. Rep. Fogarty, chairman of the Appropriations Subcommittee on Labor, Health, Education and Welfare, has been instrumental in securing funds for dental research.

COUNCIL ON DENTAL HEALTH

The state council on dental health program and the support available from the Association

The first report of the Council on Dental Health of the American Dental Association after its establishment in August 1942 indicates that its primary responsibility was "to study the need and develop plans and programs for the provision of more nearly adequate dental care for the public and to study and make recommendations concerning any other plans or programs developed to promote the dental health of the public."[1] Among the four recommendations which the Council made to the Board of Trustees in its initial report was one to the effect that "the Trustees approve the organization of state and component society councils on dental health."

Such a broad assignment of responsibility to the Council required that it consider an equally broad variety of problems and, in many instances, the Council found itself crossing into the assigned responsibilities of other agencies of the Association. Nevertheless, during the past 15 years, the Council has developed a great many sound policy recommendations which have been approved by the House of Delegates. The existing policies of the Association provide the basic principles for all programs designed to improve the dental health of the public, whether they be national, state or community.

Through the 15 years of its activity, the Association's Council on Dental Health has constantly reviewed its program in an effort to define more clearly its proper areas of responsibility and to develop a coherent and effective program. At the time of its establishment, it appeared that the Council should be assigned the responsibilities of conducting the Association's program of dental health education, developing policy recommendations and principles for the operation of plans for dental care and acting as the Association's liaison agency with public and private agencies which have an interest in dental health. The Council also developed broad principles for dental health programs along with programs for establishing the position of dental public health and the public health dentist. Here, too, the accent was on dental health education as reflected in the general programs of state councils on dental health and state dental divisions.

The title, "Council on Dental Health," seemed an appropriate one to cover these several areas of dental services. The initial concentration on dental health education expanded that program until, at the Association level, the Council on

Presented by Joseph V. Kirby, Clayton, Mo., member, Council on Dental Health, before the eighth National Dental Health Conference, American Dental Association, Chicago, April 22-24, 1957.

1. Transactions, American Dental Association, 1943, p. 62.

Dental Health and the Division of Dental Health Education were separated in 1954, and the Bureau of Dental Health Education was established. With this new administrative arrangement and with increased interest in new methods for meeting the cost of dental care, the Council has been concentrating its efforts on a consideration of plans or programs for increasing the availability of dental care to all segments of the population through the facilities of private dental practice. This activity involves two major areas of consideration:

1. Increasing the capacity of private dental practice to meet the demand for dental care.

2. Improving the methods for meeting the costs of dental care.

It will be noted that the common factor in the assignment is that of dental care. Dental health care has been defined by the Association as "the sum total of the diagnostic, preventive, remedial and restorative services rendered dental patients by practitioners legally authorized to perform such services."[2] It should be pointed out that the Association has stated repeatedly in its policies that dental health is an integral part of the total health of the individual. However, there is no counterpart of "dental health care," such as "medical health care." It would seem, then, that consideration should be given to amending the definition of dental health care to the definition of dental care.

Through the efforts of the Council, state dental societies have conducted vigorous programs for the inclusion of dental divisions in state health departments, with the result that all but one of the state health departments include a dental unit in their administrative patterns. Also, through the efforts of the Council, 38 constituent societies have established committees or councils on dental health with bylaw support; two societies have provided for the activities of a council on dental health but separate the responsibilities between two or three agencies, and 13 societies have no specific provision for councils on dental health or their activities.

A review of the duties of state councils on dental health as prescribed in their bylaws shows that 27 societies authorize their councils to consider the problems of dental care, dental health education and liaison with public and private agencies that have a dental health interest. Twenty-five societies limit the activities of their councils to the conduct of the societies' dental health education programs. Some of these establish the council as the liaison agency between the society and public or private health agencies.

In general, it may be said that the greatest efforts of state councils on dental health have been devoted to programs for dental health education and to the development and strengthening of dental divisions in state health departments. With few exceptions, even those state councils which are authorized under their bylaws to consider the problems of dental care have devoted little or none of their efforts to dental care programs.

The tremendous expansion of new methods for meeting the cost of health care through private insurance carriers, Blue Shield and Blue Cross and closed panel medical clinics, has alerted dental societies to the necessity of developing plans and mechanisms for meeting the cost of dental care. The dental aspects of the economic problems of health care have been particularly accentuated by the development of the ILWU-PMA (International Longshoremen's and Warehousemen's Union-Pacific Maritime Association) dental program on the West Coast and the establishment of a wide variety of closed panel dental practices by unions and other agencies throughout the country.

2. Transactions, American Dental Association, 1956, p. 202.

The problems associated with the development of new methods for meeting the cost of dental care are directly related to the conduct of dental practice and are quite different from those involved in the development of programs for dental health education of the public. It seems only natural, then, that, in solving these problems, the dental societies have looked, generally, to sources of leadership other than their councils on dental health and have established separate agencies within their administrative patterns. Most dental societies have organized committees under such titles as "practice plans," "dental practice" or "social research" and, in some instances, have established committees to handle the problems of individual plans such as the Veterans Administration program, public assistance welfare programs and budget payment programs. A few societies have held these problems within the framework of their councils on dental health by establishing a subcommittee on "dental care."

Consideration should now be given to coordinating under a suitable agency the efforts of dental associations related to the problems of dental care. The agency should have a descriptive title, proper bylaw support and a better defined program.

The purpose of this discussion is to suggest some solutions for the elimination of the administrative confusion which exists at the present time and to outline an efficient and effective program for solving the problems of dental care through the coordinated efforts of the American Dental Association and its constituent dental associations.

INCREASING CAPACITY TO MEET DEMAND FOR DENTAL CARE

The solution of problems associated with increasing the capacity of dental practice to meet the demand for dental care requires information on:

1. Professional dental manpower within the state.
2. Types of organization of the dental practices in the state.
3. Design and arrangement of the dental office.
4. Staffing of the dental office.
5. Business administration of the dental practice.
6. Treatment methods.

Professional Dental Manpower Within the State • The dental society will require extensive information on the available professional manpower in the state, the geographic distribution of the dentists, their age distribution, the type of practices they conduct and the patient load which they can serve. The society also should have information on the present need for additional dentists and on predictable future requirements as to number and distribution. The society, or its council which deals with the problems associated with dental care, will not be able to conduct all of the studies necessary to produce this information. The council can determine what information is required and, with the assistance of the dental division of the state health department, lay out a program for conducting the studies. It can then determine what agencies are prepared to conduct the studies and interest them in doing so.

The dental division of the state health department is equipped to measure the dental health resources and compile pertinent statistics through its statistical division. The universities of the state, through their departments of sociology and economics, provide a fine resource for advice and assistance to a dental society. In New Mexico, the bureau of business research at the state university conducted a study of dental manpower needs and future trends at the request of the state dental society.[3] In

3. Ximenes, V. T. Demand for dentists in New Mexico. Santa Fe, New Mexico Department of Public Health, 1957.

Missouri, a similar study is being designed by the state university's sociology department.

Types of Organization of Dental Practices in the State • The dental society's council should design studies and methods for compiling information on the various patterns for organizing dental practice in the state and for making this information available to the membership. For example, how many dentists engage in solo practice and to what extent do dentists practice in groups of two or more? In group practices, what are the legal and business arrangements under which the dentists centralize the rendering of dental care? Some of the information could be made a part of the society's membership records and be currently available from that source.

The development of questionnaire studies in the area of dental practice can be part of the program of the council. Some studies might well be conducted by the society without the aid of other agencies.

Design and Arrangement of the Dental Office • Most of the development in design and arrangement of the dental office has resulted from the slow accumulation of the individual experiences of dentists who have made suggestions to and demands on dental manufacturers for improvements. Although the state dental society may not be able to conduct large and expensive studies involving such elements as motion and time, design and architecture, it should know what contributions can be made by other agencies in the state—the architectural schools, the schools of industrial engineering and so on. The society, through its program for continuing education, should stimulate the interest of the membership in the development of study sections or study clubs to work with engineers and designers in solving the problem of making the physical arrangement of the dental office more efficient.

Through its council, the dental society can organize a program for considering the equipment needs of the dental office and the development of new methods for meeting the costs of such equipment. Moreover, in both of these areas, the society could provide valuable information to the membership in the selection of locations as well as the establishment and equipping of the office. With such information, it could advise and assist communities and their banks in obtaining additional dental manpower for the community.

Staffing of the Dental Office • No factor in increasing the capacity of dental practice to meet the demand for dental health care has had more concerted study nor resulted in more dramatic statistics than the relation of auxiliary personnel to dental practice. The Bureau of Economic Research and Statistics of the American Dental Association has conducted some excellent studies in this area. An extension of these studies through the state society and its council will produce even more effective information. Such information will not only be particularly beneficial to the dentists in the area where it is compiled, but it will be of specific help in solving the problems of providing more auxiliary personnel in the state.

Business Administration of the Dental Practice • The business administration of a dental practice is directly related to the problem of developing methods for meeting the costs of dental care and will have a measurable effect on such costs. Here again, the council can compile information for the membership and make recommendations for the inclusion of such information in the society's program for continuing education.

Treatment Methods • In general, the development of treatment methods and the understanding of the disease conditions for which the treatment is provided have

and will continue to receive proper attention from the dental schools and the individual leaders in the dental profession as well as other agencies in the health sciences. There are certain phases which could well have the attention of the council in developing information in new areas and making it available to the membership. Examples of such activities are the compilation of information on the use of hypnosis in dental practice, the problem of rendering dental care to the chronically ill and the specific problem of dental management of the mentally ill patient.

IMPROVING METHODS FOR MEETING COSTS OF DENTAL CARE

The state dental society has been established as the logical agency to provide professional advice and assistance in the development of plans and programs for meeting the costs of dental care. The experience of the organized dental profession in the development of such programs indicates that there are no ready-made statistics on which to base such advice and assistance. As was so well stated at last year's Dental Health Conference,[4] no new form of insurance is ever based on ready-made statistics; such statistics simply do not exist for insurance purposes. The carrier has to insure first and then get statistics.

The development of new methods and plans for meeting the costs of dental care requires the best possible planning and a willingness on the part of the society to take into account the specific statistical information that has been gathered. There are certain statistical studies which can be conducted by the dental society in order to have sound information on which to base its advice and assistance. No program can be developed and initiated in perfect form. However, if the risk is well calculated on the basis of accurate information and all of the parties to the program are willing to make adjustments, there need be no opposition to the experiment on the basis of fear.

The council will need to have adequate statistics on the dental needs of the people for whom the program is to be developed. It should be understood that the measurement of such needs is not related to the study of specific disease but to the volume of dental care which must be provided under the plan. The council will need to know what the costs of dental care are in the vicinity in which the program is to operate.

The society must have available information on the several mechanisms through which the cost of dental care is to be met. Early in its program, the society should recommend policy establishing the state dental society as the official agency through which all requests for information, advice and assistance relative to plans for the group purchase of dental care are to be referred.

Methods for meeting the costs of dental care can be classified as:

1. Direct purchase of dental care by an individual through his own personal resources.
2. Purchase of dental care by an individual through an organized program.
3. Purchase of dental care by a group through an organized program.

The first method of purchase has had the attention of the profession since its beginning. The second method is receiving increasing attention and will be the subject of future publications of the Council on Dental Health of the American Dental Association.

State councils should include in their programs consideration of the mechanisms being used to establish the eligibility of beneficiaries under group purchase programs and to administer payment for the dental care provided. At present, pro-

4. Dental health care "is" insurable, Pennsylvania dean tells conference. Dental Health Highlights 12:21 June 8, 1956.

grams are being administered by the agencies operating them, such as state welfare departments, the Veterans Administration, the Defense Department (Medicare); through dental care service corporations, such as those in Oregon and Washington; through insurance companies, as in California. It is clear that a state society must be in a position to recommend some acceptable administrative mechanism if the dental care provided under organized group purchase programs is to be channeled to the offices of private practice. It is becoming evident that the dental service corporation is a highly desirable administrative mechanism. State societies should give immediate consideration to the establishment of such service corporations. In this consideration, the need for permissive legislation if no adequate statutory authority exists in the state must be remembered, as well as the necessity for appropriate articles of incorporation and bylaws.

The state council should compile current information on the group purchase programs which are operating in the state and should study and evaluate them periodically. It should maintain constant liaison with the agencies which are operating group purchase programs, whether they are state governmental agencies such as the welfare department, or federal governmental agencies such as the Veterans Administration and the Defense Department. It should stay abreast of new directives and regulations which govern the operation of the programs. The council should develop and maintain contact also with private agencies which operate programs for dental care, whether they are operated by union-management welfare funds or private philanthropic agencies.

Finally, the council may properly be assigned the state dental society's responsibility for maintaining liaison with the public health department and for providing consultation services to that department. In those states which have the most effective dental divisions and the best public health dental programs, the state societies have taken an active part in supporting these programs and in assisting in the procurement of the necessary appropriations.

RESOURCES OF THE ASSOCIATION TO SUPPORT STATE PROGRAMS

The program of the Council on Dental Health of the American Dental Association will continue to be re-evaluated and expanded to make it more effective in the enunciation of broad principles for the development of programs for increasing the availability of dental care to all segments of the population through the facilities of private dental practice. The Council will continue to study, develop and compile information to guide state dental societies in the operation of their programs.

The Council will continue to sponsor conferences on problems associated with dental care in order to provide an opportunity for the direct exchange of ideas. Such conferences, also, will help the Council to keep aware of the dental care problems of state societies and will be of value to the Council in developing its program and its policy recommendations to the House of Delegates.

The Council recommends that state agencies dealing with the problems of dental care adapt the mechanism of the working conference to the solution of these problems. They will find it an effective aid in the development of sound programs and a valuable source of information to the membership of the American Dental Association.

BUREAU OF LIBRARY AND INDEXING SERVICE

The American Dental Association Film Library

The film, "Equilibration of Occlusion and Splinting," and the filmstrip, "Let's Visit the Dentist," are two of the new audio-visual materials acquired since the publication of the supplement to the booklet, *Audio-Visual Materials in Dentistry*. The film can be rented for $2.50, the filmstrip for $1.00. The booklet and its supplement can be obtained free of charge from the Film Library, 222 E. Superior St., Chicago.

It should be noted that the film, "Equilibration of Occlusion and Splinting," which is suitable for professional groups only, has a magnetic sound track. The sound can be heard, therefore, only if the film is projected on a 16 mm. projector with a magnetic sound attachment. Where this type of projector is unavailable, the film can still be projected on a 16 mm. optical sound projector as a silent film. Mimeographed guides prepared by the producers will accompany all film shipments.

The filmstrip must be projected on a 35 mm. filmstrip projector or a slide projector with a 35 mm. attachment. Since the legends are self-explanatory, no guide is necessary.

FILM REVIEW

Equilibration of Occlusion and Splinting • 16 mm., color, magnetic sound, 42 minutes. Produced in 1955 by the New York University, College of Dentistry, with the collaboration of Samuel C. Miller, Sidney Sorrin, Marvin Simring and William Greenhut. Photography by William Greenhut, D.D.S. For purchase arrangements write to the producer, 209 E. 23 St., New York 10.

The purpose of this film, as stated by the producer, is to demonstrate the actual technics used in clinical periodontal procedures. The film opens with an outline of the steps in the equilibration of occlusion which covers preliminary grinding for improvement of esthetic appearance, reduction of leverage and elimination or reshaping of malposed teeth, recontouring of marginal ridges, elimination of plunger cusps, balancing of centric occlusion, and smoothing of the ground surfaces. This is followed by discussion and demonstration of the armamentarium used. Each of the steps is then demonstrated on a patient.

This film is well organized. The photography enables the viewer to see the intraoral views clearly. It is suitable for dental students and practitioners.

FILMSTRIP REVIEW

Let's Visit the Dentist • 35 mm., color. Produced by Society for Visual Education with the cooperation of the American Dental Association. Can be purchased for $5.50 from the producer, 1345 Diversey Parkway, Chicago.

This filmstrip shows the friendly relationship existing between the patient and the dentist, good dental health practices and technics for proper toothbrushing. It opens by showing Nancy, a primary school child, with two missing front teeth. This is followed by the dentist's explanation for the loss of deciduous teeth, their importance and the need for regular visits to the dentist. Nancy is seen in the dental chair where she has fun "riding up and down." The dentist explains the uses of the dental mirror and also what cavities are while he prepares Nancy's. Diet is also discussed. Nancy then prepares a scrapbook to show what she has learned. The book is divided into "Things to Eat," "Cleaning Your Teeth," and "Good Things to Know." The filmstrip concludes with an explanation by the dentist of the meaning of "permanent" teeth and how many six-year molars there are.

This is an excellent filmstrip for use in the primary grades. A guide which can be used by teachers is noted at the beginning. The teacher can show the whole filmstrip as an introduction and later as a review in the study of dental health. Specific frames can be used to focus on visits to the dentist, deciduous teeth, permanent teeth and diet.

COUNCIL ON DENTAL RESEARCH

Supplement to list of certified dental materials

SURVEY • From time to time products on the List of Certified Dental Materials are tested for continued compliance with American Dental Association specifications.

Samples of the certified inlay casting gold alloys were tested by the American Dental Association Research Division at the National Bureau of Standards under the supervision of that Bureau. The following certified materials were found to comply with the specification. This list supersedes the section on certified inlay casting gold alloys in the List of Certified Dental Materials Revised to December 1, 1956, published in the January 1957 issue of THE JOURNAL.

CERTIFIED DENTAL INLAY CASTING GOLD ALLOYS (A.D.A. SPECIFICATION NO. 5)

TYPE A, SOFT

Alloy	*Manufacturer or distributor*
Aderer-A-Soft	Julius Aderer, Inc.
Baker Inlay Soft	Baker & Co., Inc.
Chilcast No. 1	Vernon-Benshoff Co.
Coe 1	Coe Laboratories, Inc.
Crown Inlay No. 2 Soft; K	General Refineries, Inc.
Deeone	Handy & Harman
GB Inlay No. 1 Soft	Goldsmith Bros. Smelting & Refining Co.
Jelenko Special Inlay	J. F. Jelenko & Co., Inc.
Leff Light Inlay	Leff Dental Golds
Luft "A"	John Luft Prescription Alloys
Mowrey's S-1; S-M	W. E. Mowrey Co.
Ney-Oro A; AA	The J. M. Ney Co.
Noble No. 1	Noble Metals & Alloys Co.
Research A	Precious Metals Research Works, Inc.
Spyco Soft; Eleven	Spyco Smelting & Refining Co.
S. S. White No. 2; 900 Soft; 940 Very Soft	The S. S. White Dental Mfg. Co.
Stern S	I. Stern & Co., Inc.
Wildberg A-2	Wildberg Bros. Smelting & Refining Co.
Williams Inlay 3; Will-Cast 22	The Williams Gold Refining Co., Inc.

TYPE B, MEDIUM

Alloy	*Manufacturer or distributor*
Aderer-B-Medium	Julius Aderer, Inc.
Aleco No. 1; No. 2	A. L. Engelhardt Co.
Baker Inlay Medium	Baker & Co., Inc.
Chilcast M; 2M	Vernon-Benshoff Co.
Coe 2	Coe Laboratories, Inc.
Crown Inlay No. 1 Hard; Knapp No. 2; T	General Refineries, Inc.
Deetwo	Handy & Harman
GB Inlay No. 2 Medium Hard	Goldsmith Bros. Smelting & Refining Co.
Jelenko Modulay; Platincast	J. F. Jelenko & Co., Inc.
Leff Medium Soft	Leff Dental Golds

Luft "B"	John Luft Prescription Alloys
Mowrey's B-Inlay; S-2; No. 91; T	W. E. Mowrey Co.
Ney-Oro A-1; A-10	The J. M. Ney Co.
Noble No. 2	Noble Metals & Alloys Co.
Spyco Inlay; Medium; Tinker One	Spyco Smelting & Refining Co.
S. S. White No. 1; No. 5; No. 820	The S. S. White Dental Mfg. Co.
Stern 1	I. Stern & Co., Inc.
Wildberg "A"	Wildberg Bros. Smelting & Refining Co.
Wilkinson 8M	Wilkinson Co.
Williams Pioneer; Special Inlay; One "Inlay"	The Williams Gold Refining Co., Inc.

TYPE C, HARD

Alloy	*Manufacturer or distributor*
Aderer-C-Hard; "Dressel"	Julius Aderer, Inc.
Baker Hard Inlay	Baker & Co., Inc.
Chilcast No. 2; No. 2-H	Vernon-Benshoff Co.
Coe 3	Coe Laboratories, Inc.
Crown No. 9; Knapp No. 3; Supreme Inlay; TT	General Refineries, Inc.
Deesix	Handy & Harman
GB Inlay No. 3 Hard	Goldsmith Bros. Smelting & Refining Co.
Jelenko Durocast; Firmilay; J-9	J. F. Jelenko & Co., Inc.
Leff C	Leff Dental Golds
Luft "C"	John Luft Prescription Alloys
Mowrey's S-3; Special; No. 120; TT	W. E. Mowrey Co.
Ney-Oro B; B-2	The J. M. Ney Co.
Noble No. 3	Noble Metals & Alloys Co.
Research No. 5; "Inlay"	Precious Metals Research Works, Inc.
Spyco No. One-H; Six; Tinker Two; Hard	Spyco Smelting & Refining Co.
S. S. White No. 8; No. 13; 860 Hard	The S. S. White Dental Mfg. Co.
Stern 2; 3337; H	I. Stern & Co., Inc.
Wildberg "C"; B	Wildberg Bros. Smelting & Refining Co.
Williams Klondiker; Special "Four"	The Williams Gold Refining Co., Inc.

COUNCIL ON LEGISLATION

Testimony at Senate hearings on appropriations for the National Institute of Dental Research

On May 6, 1957 Thomas J. Hill, chairman of the Council on Dental Research, testified before Senator Hill's appropriations subcommittee to urge that $3,700,000 be included in the federal budget for the construction of the National Institute of Dental Research building. Dr. Hill also recommended an increase of $1,000,000 for the research grant programs administered by the dental institute. Bernard J. Conway, secretary of the Council on Legislation, accompanied Dr. Hill.

Letters and wires from many constituent and component societies in support of the Association's recommendations were received by members of the Senate. It is apparent, however, that the "economy drive" will militate against any substantial increases in federal appropriations this year. The recommendations of the Association, nevertheless, have received favorable comment from members of both the House and Senate Appropriations Committees. Dr. Hill's statement follows:

I am Thomas J. Hill of Cleveland, Ohio. I am chairman of the American Dental Association's Council on Dental Research. I have served as a member of the National Advisory Dental Research Council for the National Institute of Dental Research and am presently a consultant to that agency. With me is Mr. Bernard J. Conway of Chicago, secretary of the Association's Council on Legislation. I am here today to present the Association's recommendations on the need for construction funds for the National Institute of Dental Research building and for an increase in the appropriations for the dental health activities of the Public Health Service.

NEED FOR BUILDING AND FACILITIES

Only last year, the American Dental Association through its efforts as an organization and through the petitions of thousands of its members eloquently illustrated to Congress the immediate need for constructing a building for the National Institute of Dental Research. As a result of these efforts both Houses of Congress overwhelmingly approved the enactment of a measure (S. 3246, 84th Congress) to increase the funds authorized in 1948 (P.L. 755, 80th Congress) for the Dental Institute building from $2,000,000 to $4,000,000. After enactment the President promptly signed the legislation into law (P.L. 732, 84th Congress).

Shortly after this increased authorization was enacted, Congress appropriated $200,000 within the "Second Supplemental Appropriations Act, 1957" (P.L. 855, 84th Congress) for the preparation of plans and specifications for the Dental Institute building.

The President's budget estimate for the next fiscal year indicates that the fiscal 1957 appropriation of $200,000 for plans has been obligated, with $150,000 being spent during this fiscal year and $50,000 to be spent during fiscal 1958. The original plans completed in 1950 cost about $100,000.

Thus, $300,000, a substantial portion of the $4,000,000 authorized for the Dental Institute building, is already committed. Despite this, the President's fiscal 1958 budget estimate eliminated a request of the Department of Health, Education and Welfare for an appropriation to construct the Dental Institute building. The American Dental Association is convinced that no sound argument exists for a further delay in constructing the Dental Institute building. The unanimous report of the Senate Committee on Labor and Public Welfare (S. Report 1719, 84th Congress) on the building authorization legislation testifies to the need for immediate construction of the building. I would like to quote from that report:

"The Committee on Labor and Public Welfare unanimously recommended and the Congress in passing the National Dental Research Act of 1948 approved and authorized the construction of a building to house the activities of the National Institute of Dental Research. In that legislation the Congress authorized an

appropriation of not to exceed $2,000,000 for the construction of that building. Subsequently, the Congress appropriated $100,000 which was used to develop building plans and specifications for the Dental Institute. The conflict in Korea intervened, however, and, of necessity, the construction work had to be postponed. Subsequently, and despite the fact that plans for the building have been drawn at a great cost, there has been no appropriation to begin its construction. The explanation is very simple. It lies in the fact that building costs have advanced considerably since 1948, and while the sum of $2 million was undoubtedly sufficient at that time, to construct the Dental Institute building in accordance with the already approved plans, it would, it is estimated, cost a great deal more now than the amount originally estimated. Failure to initiate the construction of the Dental Institute building at the time Congress authorized the project has proved a most costly postponement. If this construction should be further postponed, it will be still more wasteful. More important than the monetary aspects of this situation, however, is the fact that lack of proper facilities for the Dental Institute's program poses a serious threat to this Nation's progress toward the effective control and prevention of dental disease."

INADEQUACY OF EXISTING SPACE AND FACILITIES

The American Dental Association has firsthand knowledge of the physical facilities needed by the Dental Institute. The Association's president, Harry Lyons, and two members of the Association's staff have served on the National Advisory Dental Research Council. H. Trendley Dean, secretary of the Association's Council on Dental Research, served as director of the National Institute of Dental Research. My own evaluation of the facilities required for effective research is based on my background as a department head at Western Reserve University's Dental School charged with conducting a research program, as a member of the Dental Institute's Advisory Dental Research Council, and as a consultant to that agency.

The Dental Institute building, as planned, would contain about 35,000 square feet (net) of working space. The present facilities for dental research activities provide less than 10,000 square feet. Some of the dental schools have more working space for dental research than is assigned to the Dental Institute with its much larger scientific staff. New York University and the University of Minnesota are good examples. The former has 15,000 square feet of its facilities available for dental research; the latter has 13,000 square feet.

Seven years ago, officials of the Public Health Service indicated in testimony on the fiscal 1950 and 1951 budgets that the clinical center and other planned construction could not provide sufficient space for the Dental Institute. That prediction is now a fact.

Because of the steady and vitally needed expansion of the programs of the other Institutes of Health, the Dental Institute scientific staff has again been shifted. Most of the staff is now located in building 2 at Bethesda. In building 2, the Dental Institute has approximately 125 square feet of floor space for each principal investigator. The Association has been informed that the minimal standard allowance for the National Institutes of Health is 150 feet of space for each principal investigator. Actually, in most of the Institute buildings an average laboratory contains 218 square feet of floor space. The animal facilities for the Dental Institute at building 2, furthermore, are inadequate, and there is no area available to the dental scientists for a library where literature may be stored for convenient access to the dental staff.

There is a further factor contributing to the critical need for space. The ratio of supporting laboratory personnel to the principal scientific investigators at the Dental Institute is about one and one-half to one. The most efficient use of the highly trained research staff will require an increase to provide two or more technicians or assistants for each principal investigator. This is simply impossible under presently proposed space allocations, but could be realized within the next three years, if the construction funds for the Dental Institute are appropriated during this session of Congress.

The space and personnel problems at the Dental Institute were highlighted during last year's hearings on the building authorization legislation before the Subcommittee on Health and Science of the House Committee on Interstate and Foreign Commerce. A member of the Committee asked Dr. James A. Shannon, director of the National Institutes of Health, whether the number of supporting laboratory personnel at the Dental Institute was adequate. Dr. Shannon replied:

"I can't give you a figure for that, sir. This [supporting laboratory personnel at the Dental Institute] is calculated on the basis of space assigned to the Dental Institute. To make effective use of all their people, they would have to have more space than we can provide."

Again, the report of the Senate Committee

on Labor and Public Welfare, only last year, declared:

"The testimony of these individual witnesses as to the need for the construction of separate housing for the National Institute of Dental Research, the desirability of promptly proceeding with such construction . . . was impressive. They have convinced the Committee that the scientists now working at the Dental Institute are so crowded that effective work is difficult and expansion almost impossible. Moreover, the services of men of outstanding ability are not being utilized to the full, inasmuch as there is insufficient space to house the number of research workers who, if they could be assigned to assist chief investigators, would multiply the efficiency and output of the latter."

The National Institute of Dental Research has a mandate from Congress to conduct investigations in two areas—basic research and clinical research. Unless plans are executed now for constructing adequate facilities for the Dental Institute, its basic research program cannot attain the effectiveness envisioned by Congress. The House Committee on Appropriations, in its report of March 21, 1957, on Health, Education and Welfare appropriations for fiscal 1958, confirmed this position. On page 18 of that report (House Report 217, 85th Congress) the Committee declared:

"The policies of the Executive Branch with regard to buildings has already been discussed at some length in this report [pages 8-10]. Since there is ample information in the hearings with regard to the urgent need for a new administration building and a new dental research building, the Committee will not burden the report with a recitation of the need, but it does register its doubts that it is even an economical move to defer this construction since the Institutes are having to rent space because of the overcrowded condition in their own buildings."

NEED FOR EXPANDED PROGRAM

The dental diseases have not been dramatized as have cancer, heart disease, arthritis, and many crippling afflictions of children. Nevertheless, they account for a tremendous toll in human suffering and depreciation of health; they bear importantly upon the ability of thousands of persons to gain and hold employment.

The dental diseases are so complex in their causation that successful research on these problems requires the combined and coordinated knowledge and skills of many scientists—dentists, anatomists, histologists, nutritionists, pathologists, pharmacologists, bacteriologists, histochemists, biochemists, physiologists, physicists, roentgenologists, physicians, statisticians, and others. Only in an adequately housed, equipped and staffed National Institute of Dental Research can all these workers and their efforts be fully coordinated in an effective assault on major dental problems such as:

Cleft palate and cleft lip congenital deformities, a condition present in one out of every 800 live births in this country.

Malocclusion or crooked teeth and associated facial deformities, which have a relation to gastric disorders, facial esthetics, mental well-being, and many other aspects of health.

Dental caries or tooth decay and its infectious results, which afflict over 95 per cent of our population. For example, in rheumatic heart disease and subacute bacterial endocarditis, both of which are dramatic killers of persons of all ages, their relation to dental caries and resultant infections is an established fact.

The periodontal or gum diseases, which are essentially complete mysteries as far as their causes and prevention are concerned. Given a long enough lifetime, furthermore, everyone succumbs to some type of gum disease, accounting for the loss of 75 per cent of all teeth.

Cancer of the mouth, which accounts for 6 per cent of all cancers.

Many types of investigations in these areas which are in need of expanded research require expensive facilities and equipment that cannot ordinarily be provided by nonfederal research centers such as the dental schools. The direct research program of the National Institute of Dental Research was created to carry on such investigations. It is essential that the Dental Institute be provided with the space, facilities and equipment to launch its contribution to the dental research program that this nation deserves. The American Dental Association urges Congress to include within the fiscal 1958 budget an appropriation of $3,700,000 for the National Institute of Dental Research building.

NEED FOR INCREASE IN FUNDS FOR RESEARCH PROJECT GRANTS

The American Dental Association deeply appreciates the overwhelming support that this Committee gave to the Association's recommendations for the Dental Institute's grant programs last year. The substantial funds ($2,700,000) allocated for nonfederal dental research projects have provided a powerful stimulus to the dental schools and other re-

search centers interested in conducting dental research. The Association assured this Committee last year that these dental research institutions were prepared to initiate more than 200 projects. At that time, the Dental Institute was supporting only 45 projects. Today, the Dental Institute is supporting 275 projects. In addition, there are at least 90 applications for grants to be reviewed at the June meeting of the National Advisory Dental Research Council. In terms of the number of institutions involved, these projects and applications represent 37 of the nation's 45 dental schools and 43 other research institutions, a total of 80. In contrast, during fiscal 1956, the Dental Institute supported only 45 projects in 22 institutions. This healthy interest and extraordinary progress in dental research deserves to be maintained and heightened.

The President's budget estimate for fiscal 1958 allocates $2,825,000 to the National Institute of Dental Research for dental research project grants, an increase of $125,000 over the fiscal 1957 allocation. H.R. 6287 requires that the increase over the fiscal 1957 allocation be devoted to research rather than to an increase in the overhead allowance for research projects, as proposed within the President's budget estimate. But, should the allocation for dental research project grants during fiscal 1958 be at the level of $2,825,000 as proposed within H.R. 6287, there will be little, if any, funds available to the Dental Institute to support projects submitted during fiscal 1958. This will be true for the following reasons: First, $2,300,000 or thereabouts is needed to continue during fiscal 1958 approximately 240 projects which are beginning during this fiscal year; second, about $300,000 is needed to continue during fiscal 1958 approximately 30 projects begun during fiscal 1956 and earlier years; third, less than $350,000 of the $2,825,000 fiscal 1958 allocation will be available for beginning projects after July 1, 1957; fourth, the National Advisory Dental Research Council will review at its June meeting about 90 applications amounting to more than $1,000,000. If grants are awarded to support 30 of these projects, the $2,825,000 fiscal 1958 allocation will be committed before October of 1957.

The Association's Council on Dental Research, through its close liaison with the dental schools and research centers, believes that it is urgent that these institutions be given support for a number of new projects, many of which can be started in fiscal 1958 if the Dental Institute has the funds to support them. Some of these important investigations are in the following fields.

Radiation and methods for improving dental x-ray technics

Congenital anomalies of the mouth

Tobacco as a factor in oral cancer

Malocclusion and associated deformities

Periodontal disease in higher primates

Biological stress and periodontal disease

The Papanicolaou technic in respect to oral cancer (early recognition of cancer)

Bone physiology—the tolerance of bone to various types of metal and non-metal implants

Oral infections—*Streptococcus viridans* and its relation to subacute bacterial endocarditis

Dental caries—exploration of methods for preventing new cavities from forming under fillings

Dental caries—control of tooth decay in persons who do not get fluoridated water in childhood

Dental caries—prenatal dietary influences

Periodontal (gum) disease—understanding the mechanism of inflammation

Periodontal disease—epidemiological studies of general and selected populations

Salivary glands—their relation to oral and general systemic health, including a study of trace inorganic elements, proteins, and enzymes

Physiology of the mouth

The American Dental Association believes that it is imperative that Congress provide at least an additional $500,000 for the project grant program of the National Institute of Dental Research.

NEED FOR INCREASE IN FUNDS FOR TRAINING GRANTS

The Dental Institute has inaugurated a program of training grants to support the establishment of research training centers in the dental schools and other dental research institutions. The significance of this program is fully recognized by the Association. The expansion of this nation's health research efforts depends primarily upon increasing the number of competent and devoted research scientists.

The $500,000 allocated for dental training grants during fiscal 1957 has already been awarded to support new or enlarged training centers in 16 schools and other research institutions. Each of the training centers supported from this year's allocation will need even greater support for from three to four additional years as their programs reach their peak levels. Thus, unless there is an increase in the $500,000 allocation for training grants during fiscal 1958, none of the training programs will be able to enroll the number of young aspiring

scientists that could otherwise be absorbed. This will mean a further delay in producing vitally needed research scientists. Additionally, to hold the training grant allocation at the fiscal 1957 level means that no new training programs will be supported during fiscal year 1958.

The American Dental Association strongly urges Congress to provide an additional $500,000 for the training grants program of the National Institute of Dental Research.

It has been a strong conviction of the American Dental Association that our federal government should respond to the urgent appeals of the dental profession to support and engage in research which may lead to the preventive solution of diseases afflicting our entire population. This is economy of the highest type. Speaking of dollar economy, I would like to point out that the American Dental Association cooperated with Congress only a few years ago to accomplish a substantial saving in federal expenditures. In 1953 and 1954, both the House Veterans' Affairs Committee and the House Appropriations Committee expressed their concern over the annual expenditures for the outpatient dental care of veterans. In fiscal 1952 nearly $40,000,000 of federal funds was spent for this purpose. In 1954, the Association developed a realistic, yet equitable, plan for the dental care of veterans. This was enacted into law in 1955 (P.L. 83, 84th Congress). I would like to call your attention to the proposed budget for veterans outpatient dental care for fiscal 1958; it is in the order of $5,000,000.

ASSOCIATION'S RECOMMENDATIONS

In summary, the American Dental Association urges Congress to include in the fiscal 1958 budget for the Public Health Service $3,700,000 for the construction of a building and facilities for the National Institute of Dental Research.

The Association also urges Congress to increase the fiscal 1958 appropriations for the Dental Health Activities of the Public Health Service from the $6,430,000 proposed by the President to $7,430,000. The recommended increase of $1,000,000 would apply to the grants program of the National Institute of Dental Research: to increase the funds for research project grants from $2,825,000 to $3,325,000 (a $500,000 increase); to increase the funds for research training grants from $500,000 to $1,000,000 (a $500,000 increase).

In behalf of the American Dental Association, I thank the Committee for the opportunity of presenting this testimony.

BUREAU OF ECONOMIC RESEARCH AND STATISTICS

The 1956 survey of dental practice
IX. Summary

As a means of gathering essential information on dental practice, a questionnaire was sent in April 1956 to every third dentist throughout the United States. Twenty-two per cent of the recipients took the time and effort to complete the four-page questionnaire, returning 6,044 usable questionnaires.

So far as could be determined, dentists responding in the survey were closely representative of dentists in general, although the response from nonmembers of the Association was relatively low. Undoubtedly it is true that the 78 per cent who did not respond differ in ways not readily measurable from the 22 per cent who did respond. There is evidence that the bias in survey findings resulting from nonresponse is not large, and that the survey statistics would be nearly the same had all dentists receiving questionnaires responded.

The mean net income in 1955 of all dentists responding was $12,241, 16.1 per cent more than was reported in a similar survey covering 1952. The median was $11,116. Independent (nonsalaried) dentists reported a mean net income of $12,480 and a median of $11,533, compared to $9,309 and $8,600 for salaried dentists.

Regionally, the highest mean net income of independent dentists was in the Far West ($15,991), followed by the Southwest ($13,426); Southeast ($12,424); Central ($12,394); Northwest ($11,529); Middle East ($10,899), and New England ($10,736).

Mean gross income of independent dentists ranged from a high of $29,398 in the Far West to a low of $19,130 in the Middle East. The ranking of regions with respect to gross income was the same as with respect to net income except that the positions of the two lowest regions, Middle East and New England, were reversed.

Incomes of independent dentists by city-size were lowest in places of less than 1,000 population, rose gradually to a peak in cities of between 50,000 and 100,000, and fell off somewhat in the largest cities. Notable exceptions among the large cities were Los Angeles, with a mean net income of $17,529, San Francisco ($15,730) and Detroit ($14,603).

Nonsalaried orthodontists reported a mean net income of $22,130, followed by oral surgeons ($16,949); pedodontists ($16,027), and general practitioners ($12,000). An insufficient number of replies was received from independent periodontists and prosthodontists to allow presentation of averages, but indications were that their means would have fallen between those of general practitioners and pedodontists.

There was a close correlation between (1) number of dental chairs and employees and (2) mean gross and net income. Among dentists with one chair, the mean was about 50 per cent higher for dentists with one employee than for dentists with no employees. As number of chairs and employees increased, income also increased.

The professional expenses of independent dentists amounted to 43.5 per cent of gross income in 1955 compared to 42.2 per cent in 1952. The largest items

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of expense were salaries of auxiliary personnel and commercial prosthetic laboratory charges, which together accounted for slightly over half of all professional expenses.

Based on the gross income reports by respondents, it was estimated that civilians spent $1,600,000,000 for dental care during 1955. Of this amount, dentists paid out about $700,000,000 in professional expenses, including $100,000,000 for dental supplies and drugs and $160,000,000 to commercial prosthetic dental laboratories.

Respondents were asked to estimate what percentage of all their prosthetic work was sent to commercial laboratories. From the replies to this question it was estimated that 70.4 per cent of all dental laboratory work in 1955 was done by commercial laboratories, the remaining 29.6 per cent being done in dental offices.

The increase from 1952 to 1955 in number of auxiliary personnel employed by dentists was surprisingly large. The percentage of dentists employing full-time assistants rose from 56.5 per cent in 1952 to 69.5 per cent in 1955. Estimated total number of full-time auxiliary personnel increased from 64,500 in 1952 to 82,500 in 1955, an increase of 28 per cent.

The average dental office had 610 square feet of office space, although state averages varied from 480 in Illinois to 820 in Georgia. Dentists paid on the average $2.19 per square foot for office rental during 1955. The two regional extremes were the Far West with $2.51 per square foot and the Northwest with $1.76 per square foot.

Ownership of life insurance was reported by 98.0 per cent of the independent dentists responding; malpractice insurance, 94.1 per cent; accident and sickness (disability) insurance, 84.1 per cent; hospitalization or medical insurance, 75.3 per cent; dental equipment floater insurance, 71.2 per cent, and workmen's compensation and employer's liability insurance, 35.4 per cent. There were significant variations in these percentages according to state, age and type of practice. The mean amount of life insurance carried by all respondents was $36,434 and the median was $30,000. The amount of life insurance held by dentists in the upper age brackets was much lower than amounts held by middle-aged and young dentists.

Half of all independent dentists reported working five days per week, 34.3 per cent taking one whole day off and 15.8 per cent two half days off. Nationally, Wednesday was the favorite day off, followed by Saturday and Thursday. Only 2.9 per cent of all nonsalaried dentists said they worked six full days per week. One of every 12 dentists closed his office two full days per week (other than Sunday).

The typical dentist spent 35.3 hours per week at the chair, 4.1 hours in the laboratory and 3.8 hours in other office activities, for a total of 43.2 hours per week in the office in 1955. Specialists all averaged fewer office hours per week than general practitioners.

The mean number of weeks worked in 1955 by independent dentists was 47.2 and the median was 48. By multiplying the number of weeks by the number of hours per week it was estimated that the average dentist spent 2,039 hours in his office during 1955, of which 1,666 hours were at the chair.

Nationally, 15.4 per cent of the nonsalaried respondents used general anesthetics in their offices; the percentage was almost three times as high in New England (30.4 per cent) as in the Far West (11.9 per cent). Eighty-five per cent of the independent dentists reported they had written prescriptions for drugs during the six-months' period preceding receipt of the questionnaire. About six of every ten nonsalaried dentists owned a license for prescribing narcotics.

The mean number of patients reported by independent dentists in 1955 was 1,-

056 and the median was 796. The mean number of patient visits was 2,977, an average of 2.8 visits per patient. Dentists in the Southeast region averaged about twice as many patients as dentists in the Middle East. The number of visits per patient tended to be relatively high in the eastern part of the country and low in the southern part. The number of patients per dentist tended to increase with age until about age 50 and to decline beyond that age. By type of practice, the two extremes in number of patients were oral surgeons, with a mean of 2,130 patients, and orthodontists, with a mean of 311 patients. The mean number of patients increased from 704 for dentists with no employees to 2,430 for dentists with 3.5 or more employees.

Based on the number of patients reported by dentists participating in the survey, it was estimated that 73,000,000 civilians, or 45 per cent of the civilian population, saw the dentist during 1955.

In order to evaluate the ability of dentists to meet the demand for dental care, two questions relating to dentist busyness were asked. In one question, independent dentists were asked to indicate the average length of wait for an initial appointment in 1955, and in the other question dentists were asked to check one of four given statements describing different degrees of busyness for the year 1955.

By both of these measures, dentists in the Far West region were most busy and dentists in the Middle East were least busy. Within regions, however, certain states deviated considerably from the regional figures. By type of practice, oral surgeons and prosthodontists reported being least busy, and periodontists most busy.

Nationally, the mean number of days of wait for an appointment was 12.8 in 1955 and 13.6 in 1952. The percentage of dentists desiring more patients increased to 16.2 per cent in 1955 from 15.4 per cent in 1952.

There has been much discussion of the fact that the growth in the dental profession is not keeping pace with the growth in the population. Despite the two trends of increasing population-dentist ratio and an increasing percentage of the population seeking dental care, during the period 1952 to 1955 the mean number of days' wait for a dental appointment decreased and the number of dentists desiring more patients increased. This information demonstrates that dentists have been able to keep ahead of the increasing demand for dental care. This has been done by increasing the efficiency and productivity of the individual dental office. Whether dentists can continue to keep ahead of demand for dental care in the face of an increasing population per dentist, only future surveys of dental practice will tell.

The individual dentist will find it interesting to compare his practice with others by means of the centile profile charts (Figures 2, 3, 4 and 5). These charts show the percentage of independent dentists in the United States having lower values than the values specified, for eight factors. For example, opposite the factor of "Net income" the figures indicate that 15 per cent of all independent dentists had net incomes of less than $6,048 in 1955, 50 per cent earned less than $11,533 (the median) and 85 per cent earned less than $18,801. Likewise, 10 per cent of the dentists reported having less than $10,000 life insurance and 90 per cent less than $70,000.

The median values for independent dentists in certain states, regions, age groups and types of practice have been plotted on Figures 2, 3, 4 and 5. This will enable the individual dentist to make a close comparison of his practice with the group or groups to which he belongs. For example, if a dentist practicing in the Far West earned a net income of $13,961 in 1955, he can see that his income fell in the "High Average" band and was greater than 65 per cent of the net incomes of all independent dentists in the

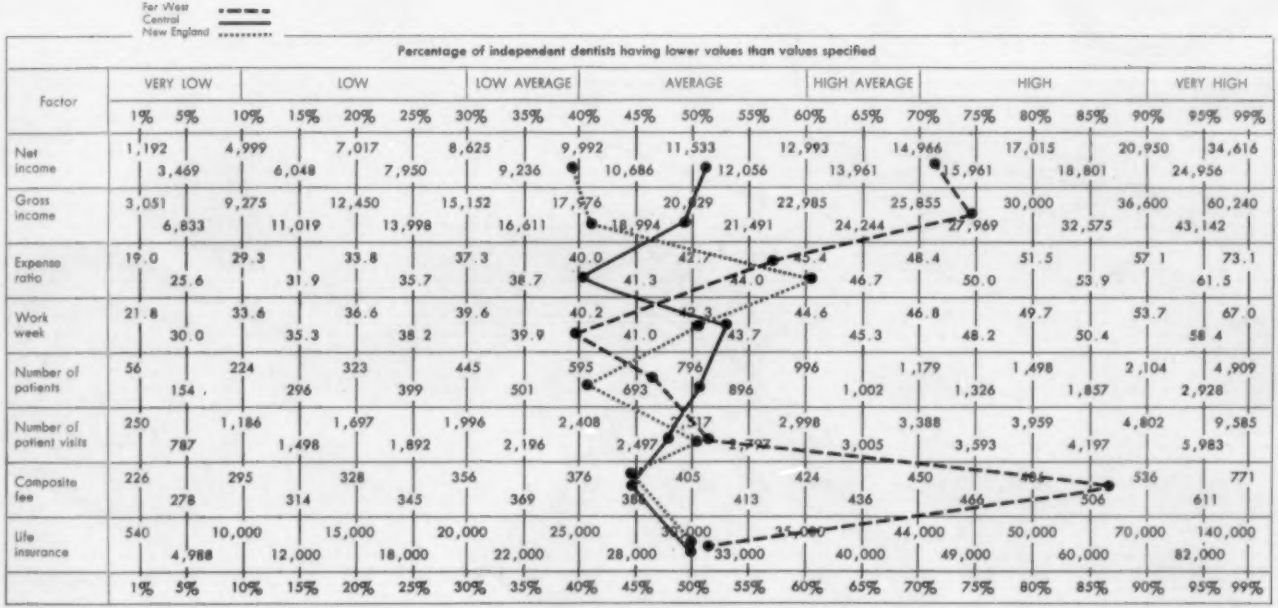


Fig. 2 • Profiles (medians) of independent dentists in the Far West, Central and New England regions, according to specified factors, 1955

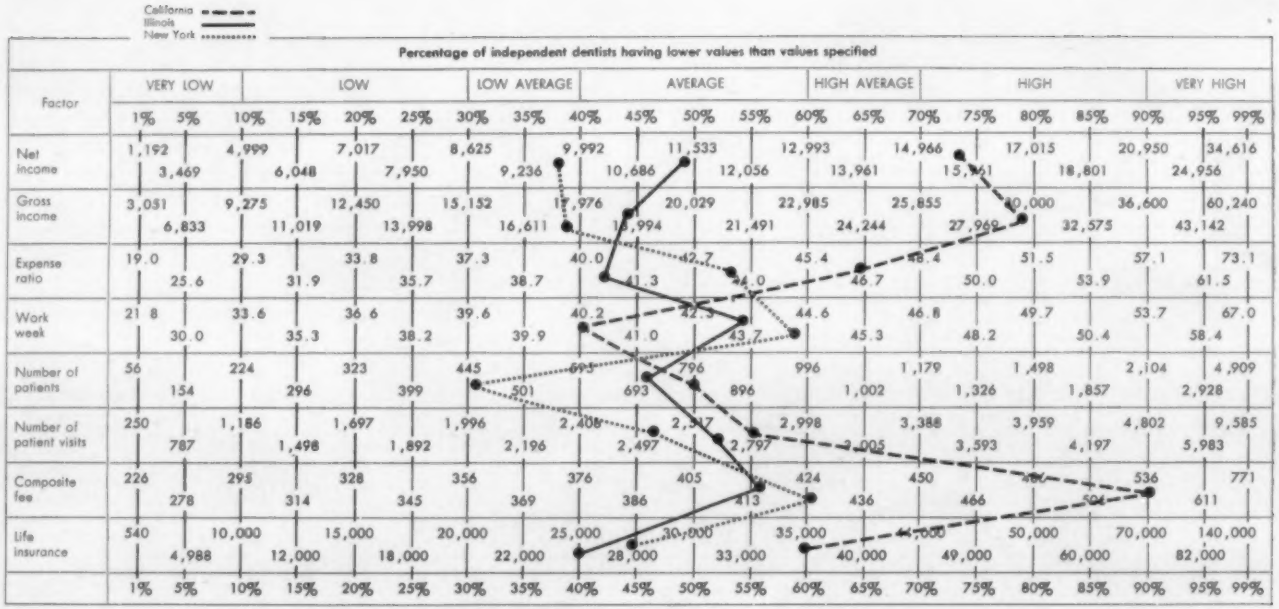


Fig. 3 • Profiles (medians) of independent dentists in California, Illinois and New York, according to specified factors, 1955

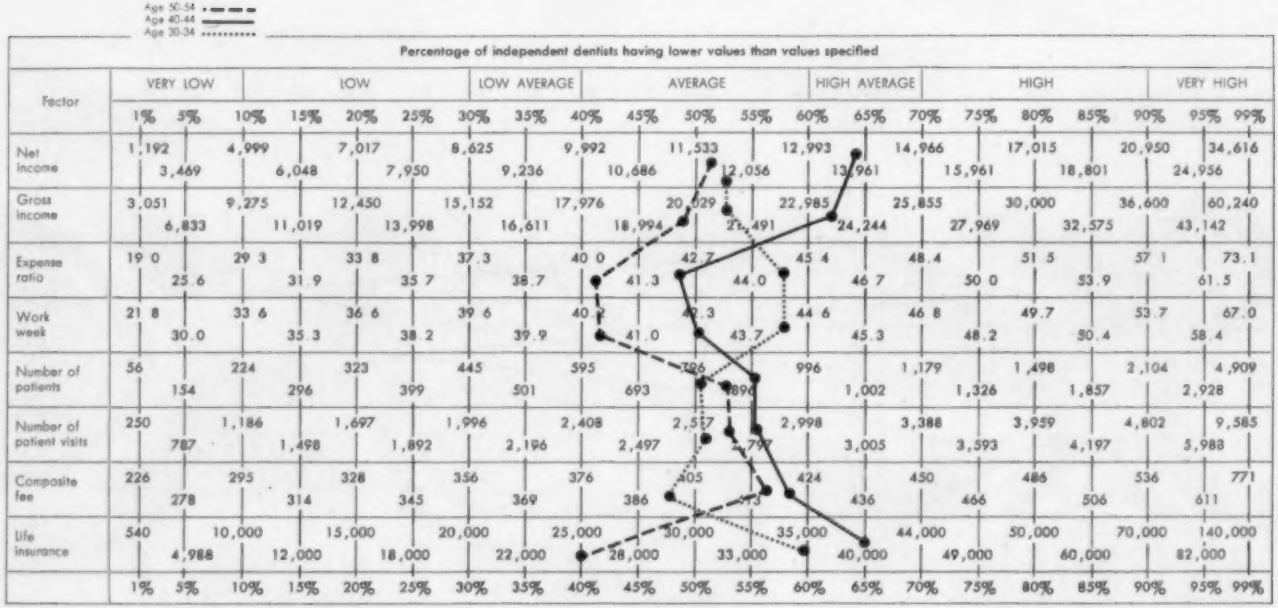


Fig. 4 • Profiles (medians) of independent dentists in certain age groups, according to specified factors, 1955

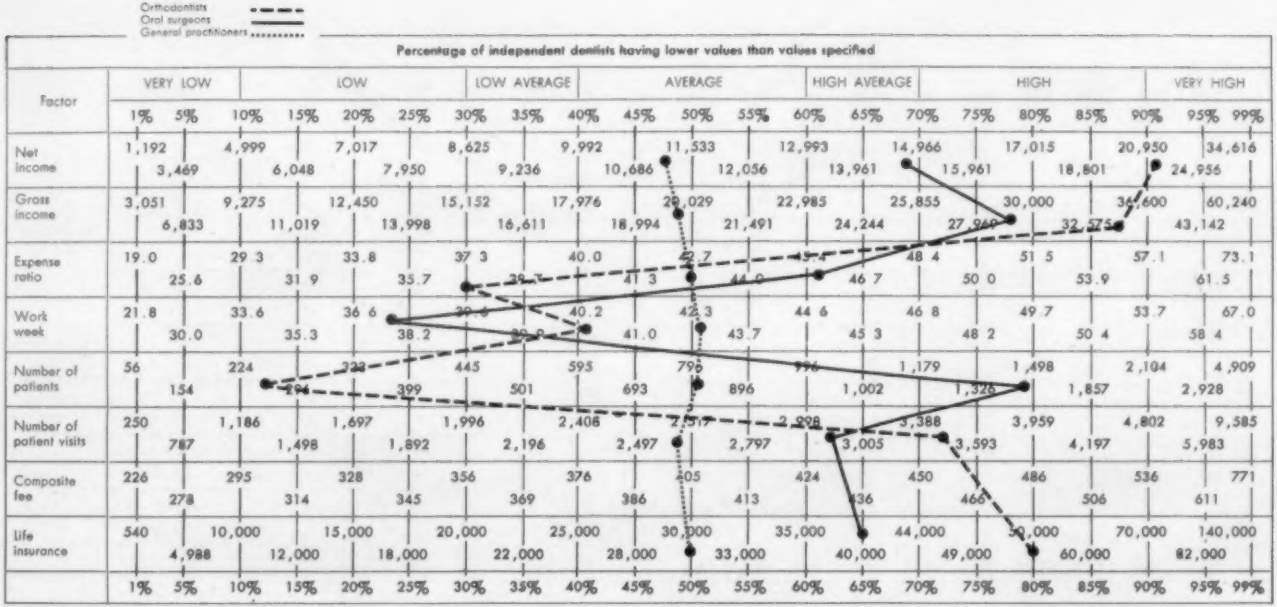


Fig. 5 • Profiles (medians) of independent orthodontists, oral surgeons and general practitioners, according to specified factors, 1955

United States. On the other hand, he can see that the median net income for the Far West region was $15,200 which is higher than his net income. Thus, the dentist can readily see that, although he received an income considerably above the national average, it was below the average for his region. Study of the other seven factors might suggest reasons why he falls below the regional average with respect to net income.

Definitions of the factors listed are as presented in previous chapters on the survey, with the exception of "Composite Fee." The composite fee is the total fee for 10 dental prophylaxes, 30 one-surface amalgam fillings, 20 single extractions, one acrylic jacket crown and one complete upper acrylic-base denture.

Limitations of space prevent presentation of profile charts for all groups. The Bureau of Economic Research and Statistics will be glad to prepare similar charts for other groups such as age groups, states or regions. A blank chart will be sent to any dentist requesting one for the purpose of charting his own practice.

This is the concluding article on "The 1956 Survey of Dental Practice." A booklet containing the entire series of nine articles will be available late in August or in September. Single copies will be sent without charge on request to the Bureau of Economic Research and Statistics.

Cases and Comments

PERIODONTAL LESIONS IN ARTHRITIS

By Stephen P. Mallett, D.M.D., Boston

Catabolic and anabolic changes that constantly take place in the human body are followed in many instances by infection, a condition which is an underlying or contributing factor to disease. Thus it is important to determine where the foci of infection are and to eradicate them whenever possible. Failure to do this makes impossible proper diagnosis and treatment.

A large series of infections of the mouth, teeth and gingiva have been studied and demonstrate that periodontal and periapical infections of the teeth can be etiologic factors in arthritis, neuritis and myositis.

Some dental observers believe that all infectious teeth should be removed; others are inclined to treat periodontal infections indefinitely or until they become acutely infected or are beyond treatment. Because periodontal infections generally permit and maintain gingival drainage, these infections seldom become acute early enough to cause extraction before valuable bone has been lost through continued resorption. There seems to be an increasing number of periodontally infected mouths where early extraction would have benefited the patients.

The case presented is one which is striking because the patient went through much unnecessary illness and pain as the result of faulty diagnosis and treatment.

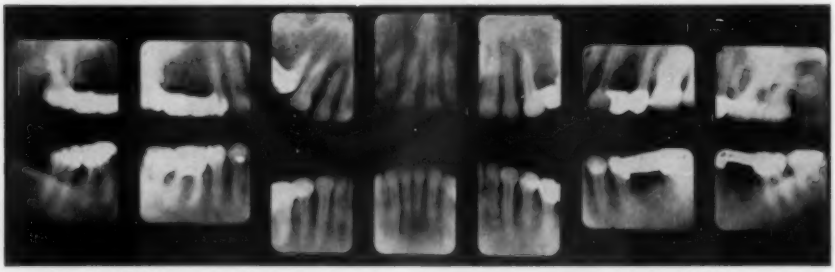
In March 1948, a 50 year old woman complained of a dull pain over her right eye which lasted for about 12 hours. A short time later, a sharp pain again developed over the right eye and extended over her right cheek and temporal and parietal bones to the midline of the skull. This steady, throbbing pain was present day and night. The entire head became tender and painful to touch, especially when the hair was combed.

One week later, the right eyelid became partially closed. At this time, the patient thought she had a cold in her eye and consulted an ophthalmologist who found nothing wrong with her eyes or vision but felt that there was some pressure on a nerve. She was then sent to a neurologist who in turn hospitalized her for further examination and diagnosis. She was seen by several physicians called for consultation.

The patient had a history of intermittent swelling of a muscular nature in the arms and legs. Her past history was that of the usual childhood diseases; menstruation started at age 13 and menopause was evident at age 48. There was no syphilis, no gonorrhea, no tuberculosis. In 1938, she had an ovariectomy and appendectomy.

Physical examination showed considerable constant pain in the head, face, arms and legs together with swelling of the joints and weakness of the arms and legs. The skin was dry and rough. Her nails were brittle. Examination of the eyes, nose and throat was negative. Tonsils were moderately enlarged. Reflexes were normal. Neurological examination gave normal results with the exception of a diminished reflex of the right leg. The chest was clear and resonant throughout; no rales were heard, nor areas of consolidation found.

The heart examination elicited a slight presystolic murmur heard best in the mitral region; there was no enlargement. Examina-



Multiple infected teeth in patient whose condition had been diagnosed as arthritis

tion of the ankles and feet showed some swelling. Temperature was 99; blood pressure—systolic, 145, diastolic, 88; red blood count, 3,550,000; white blood count, 9,100. Hemoglobin was 68 per cent. Urine, specific gravity, 1.021, no albumin, no sugar, basal metabolic rate minus 17; roentgenogram of the skull, sinus, long bone, globin insulin series, gall bladder and shadow work were negative.

While this patient was in a hospital under medical care, a diagnosis was made of arthritis, and procaine was injected supraorbitally without relief of pain. This was later followed by ligation of the right external carotid artery. The incision became infected, and swelling of the face and neck developed. The incision was opened and drained. The patient was given sedatives and vitamins and told to remain in bed for several months, that nothing more could be done for her.

After she was taken home, a dentist was called, and roentgenograms were taken. Multiple infected teeth were found (illustration), and removal was advised. On the fourth day after the patient had left the hospital, the right mandibular bicuspids and molars were extracted under local anesthesia. A simple alveoplasty operation was performed at the same time. Four periodontal pockets were excised and sutures closed the sockets. Although the procedure was painless, the patient was too nervous to have further extractions done under local anesthesia.

Six days later, she entered a second hospital and after intravenous induction of thiopental sodium and nasoendotracheal administration of nitrous oxide and oxygen anesthesia, her remaining 21 teeth were extracted, and a mandibular and maxillary alveoplasty operation performed. All periodontal pockets were excised at the same time. Clinically, at operation, the pockets showed considerable extent and depth and were beneath the mucosa where under digital pressure a slight amount of pus exuded from the free margin of the gingival tissue near several teeth. Roentgenograms and surgery showed that the pockets surrounded the teeth and extended interproximally in the bifurcations of the molars and between the bicuspids.

Streptococcus viridans was cultured from the gingiva and pockets. The patient had the usual postoperative traumatic edema and generalized swelling of the lips and cheeks, as well as moderate bilateral mandibular swelling. In three days, the patient noticed the first return to more normal feeling in her right knee and leg with generalized diminished pain throughout her arms and legs. This patient is now in good health, eight years after the extractions, and free from pain. She has been found physically fit by her physician and has gone up in weight from 106 to 140 pounds.

This case, as well as others, seems to show that in certain forms of arthritis and neuritis, or where a focus of infection is a possibility, roentgenograms of all teeth and jaws should be made; that dental consultation by medical men is too infrequently considered; and that periodontally infected teeth may cause severe infections of the body, and all infected teeth and their surrounding diseased tissues should be removed.

358 Commonwealth Avenue

INVERTED MESIODENS

By Harry Cimring, D.D.S., Los Angeles.

The mesiodens, so named by Bolk in 1917, is a supernumerary tooth occurring in the midline of the maxillary arch.

The mesiodens may be of normal size or be a token tooth, as small as one or two millimeters. Mesiodens may occur singly, severally or even in nests. The mesiodens may erupt or remain impacted. It may be of normal shape

Above: Inverted mesiodens causing rotation of central incisor. Below: Three months postoperatively

or anomalous, upright or inverted. It may cause dentigerous cysts or help create malocclusion. One theory has it that the mesiodens may fuse with the central incisor, forming an abnormally wide or misshapen tooth.

A ten year old girl was seen who had a pair of inverted, almost normal-sized teeth impacted in the midline of the maxilla between the roots of the upper central incisors and just below the floor of the nose. The mesiodens had caused one of the central incisors to become rotated (illustration, above).

The two mesiodens were removed from the lingual aspect, a procedure which necessitated a considerable loss of alveolar process. Four days later, the upper central incisors were mobile. Orthodontic treatment was postponed three months; then another three months.

5720 Wilshire Boulevard

FRACTURE OF THE GENIAL TUBERCLES

By Edwin S. Smyd, D.D.S., Detroit.

Examination revealed an ecchymosis in the midline of the floor of the mouth. The patient wore complete upper and lower dentures which had been relined on several occasions by the patient. At the time the patient was seen, the rebasing material had thickened the dentures and opened the bite. In addition, the dentures were made with cusped teeth, and the rebasing had been done while the mandible was in a protrusive position so that the intermaxillary space was increased still more. It is known that whenever the intermaxillary space is opened beyond the limits which are normal for the patient, the masticatory muscles which close the jaws are stretched and thrown into hypertonia. Resorption of the ridges takes place until normal freeway space is reestablished.

In this instance, so much alveolar resorption had taken place, especially in the region of the lower anterior ridge, that the genial tubercles (which normally occur at the midpoint on the posterior surface of the body of the mandible) had assumed a position superior to the remaining alveolar denture-bearing region.

The patient stated that the dentures again were loose. While eating he heard a crack and experienced severe pain in the floor of the mouth. He lost control of his tongue and was forced to remove both food and dentures from his mouth with his fingers.

An occlusal view roentgenogram (illustration) revealed that the genial tubercles were fractured off and had been retracted into the body of the tongue by the genioglossus muscles which have their origin on the genial tubercles. The lower denture apparently had unseated itself while the patient was eating, and the full force of the bite was brought to bear on the genial tubercles at the moment of the accident.

In view of the patient's poor physical state, the result of an episode of coronary occlusion, surgical interference for the reduction of the fracture was considered inadvisable.

Two weeks after the accident the patient was seen again. With the reduction of induration and edema, the patient regained some ability to protrude the tongue. Digital examination of the floor of the mouth revealed that some of the genioglossus muscle fibers were still attached to the mandible and were functioning.

7815 Jefferson Avenue East

Fractured genial tubercles retracted into body of tongue

STERILIZATION OF ANESTHETIC NEEDLES

By Jerome S. Mittelman, D.D.S., New York.

Proper cleansing of the lumen of finer gauge anesthetic needles has often been a problem.

Unless removed, serum from a patient previously injected may penetrate the fine bore and remain to be reinjected into the tissues of the next.

This possibility casts doubt on the efficiency of common methods of sterilization, which fail to remove substances that could cause irritating reactions in the next patient's mouth.

The newer aspirating syringes can be used to advantage to solve this problem. Not only

can the aspirating mechanism be used in testing for blood vessel penetration, but it can be used to prepare the syringe properly for sterilization.

Before removing the glass cartridge for discarding, the operator can aspirate alcohol into it, pump in and out and follow by a flushing of water. Other solutions can be used; what is essential is the mechanical removal of debris from the needle.

This use of the aspirating syringe is in keeping with dentistry's aim of achieving effective and safe local anesthesia.

30 East Sixtieth Street

MULTIPLE STONES IN WHARTON'S DUCT

By Donald R. Mackay, D.D.S., St. Paul.

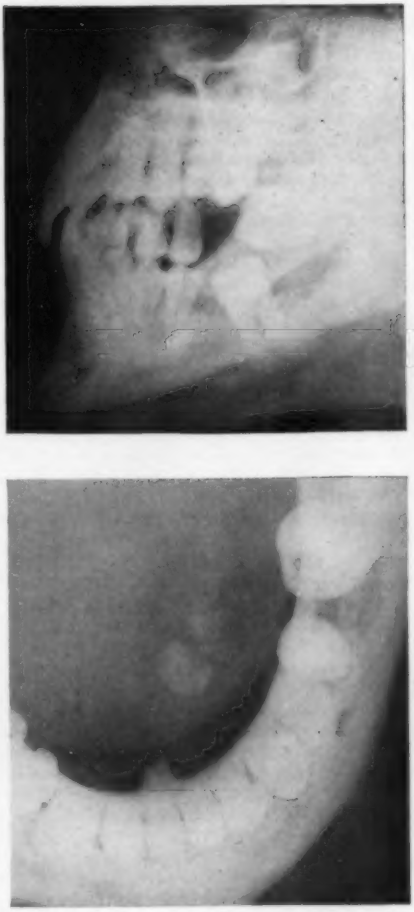
A 42 year old patient complained of intermittent swelling in the right side of the floor of the mouth. The swelling would last from two to four weeks at a time with pain on the right side of the lower jaw and a bad taste at all times. These conditions were more evident during eating.

The patient was first seen on March 17, 1951. He was normal and well-developed. He had been under his physician's care for submaxillary adenitis during the previous ten days. The therapy had consisted of penicillin and heat applications.

Except for the adenitis, he was in normal health. Temperature and pulse were normal the day of examination. The tongue and floor of the mouth on the right side were elevated about a half inch. The orifice of Wharton's duct was red and edematous with a purulent discharge. There was a moderate submaxillary adenitis on the right side.

The posterior portion of the throat was normal. Periapical intraoral roentgenograms were negative for periodontal or periapical pathologic change or impacted teeth. Lateral head and occlusal roentgenograms of the floor of the mouth disclosed from five to seven stones in the anterior two thirds of Wharton's duct (illustration). The patient was placed on 600,000 units of penicillin daily. Empirin with ½ grain of codeine was prescribed for pain.

On March 22, under local block anesthesia (2 per cent procaine), a one and a half inch incision through the mucosa parallel and superior to the duct was made in the floor of the mouth on the affected side over the anterior two thirds of the duct. The duct, lingual nerve and adjacent vessels were exposed by blunt dissection. A silk no. 00 ligation was double looped around the duct posterior to the location of the occluding stones. The duct was raised, and the seven stones delivered through a longitudinal incision on its superior surface.



Preoperative extraoral and intraoral roentgenograms show multiple stones in Wharton's duct below apex of second molar

The anterior portion of the duct was irrigated with normal saline solution through the wound outward through the orifice. The duct was returned to position, and the wound closed with no. 00 chromic sutures. The patient was continued on penicillin, 600,000 units daily, postoperatively for four days. Recovery was uneventful with no fistulas appearing from the site of the operative wound.

The preoperative and postoperative use of antibiotics is beneficial in the treatment of this type of disorder. The breakdown of alveoli and glandular walls in the submaxillary gland due to pressure from the plugging of the duct creates an area for the potential invasion of bacteria. All such glands should be treated as if they were infectious until proved otherwise.

The lack of a postoperative fistula in this instance in all probability was due to the absence of trauma or occlusion of the distal end of the duct. The passing of sounds preoperatively through the duct, if done, should be done judiciously and with a minimum of trauma. Most stones of any consequence should be removed surgically. The entrance of a sound through the orifice is traumatic, often difficult and serves no real purpose when roentgenographic diagnosis is available.

925 Lowry Building

Above: Rarefaction of interseptal bone in region of mobile upper left lateral incisor. Below: Region five months after treatment with penicillin and correction of occlusion reveals regeneration of alveolar tissues

TRAUMATIC OCCLUSION INVOLVING UPPER LATERAL INCISOR

By William S. Kirk, D.D.S., Salisbury, N. C.

A 14 year old boy complained of pain and swelling in the upper incisor region. The boy had been recently examined visually and by the use of posterior bitewing roentgenograms and was known to be caries-free.

Visual examination revealed an upper left lateral incisor tender to percussion, extremely mobile, with the adjacent lingual mucosa swollen to a size approximately that of a large grape. The boy had a one degree elevation in temperature. He could remember no blow or injury to the tooth, and the tooth responded within normal limits to vitality tests, with a slightly reduced reaction to cold.

Roentgenographic examination of the region revealed extreme rarefaction in the distal interseptal bone, one-half to two-thirds the root length, and slight rarefaction in the mesial interseptal region (illustration above).

At the time of examination, it did not seem that the swollen tissue on the lingual aspect would benefit from incision and drainage, although the region closely resembled a parietal abscess.

During the next 48 hours, the patient was kept under observation and was treated with penicillin, administered systemically. Occlusion was relieved at the initial visit as the tooth was in slight traumatic relationship in left lateral excursions.

After 48 hours, all pain, swelling and temperature had gone. The mobility persisted. The tooth still appeared to be in traumatic relationship, so occlusion was adjusted further and kept under observation.

After ten days' observation, the mobility of the tooth was slightly less. The patient continued to be symptom-free; occlusion was adjusted several times over a period of two months. The mobility of the tooth continued to decrease.

A follow-up roentgenogram five months later revealed a remarkable regeneration of the alveolar tissues (illustration below). The tooth remained symptomless and vital.

200-02 Wallace Building

REFERRED PAIN

By R. M. Lord, D.D.S., Little Rock, Ark.

In 1935, a 22 year old woman came into the office for the removal of a lower left third molar.

The teeth on the left side of the mandible were all in excellent condition and roentgenographically clear. The upper posterior teeth were checked and were normal. The left

submaxillary gland was normal to palpation as were the high cervical lymph nodes.

She was asked to apply hot wet packs until localization of symptoms could be obtained. A prescription for pain relief was given.

On the third day, a rounded labial localization of infection appeared above the apex of the upper left central incisor. With the removal of the upper central incisor, complete relief from pain in the lower molar region was obtained. There was no recurrence of pain in the following month.

About the first of November 1956, a man aged 34 came in with a complaint of pain around an upper left second molar. The entire lateral antral region was sore to touch. The tooth was sore to lateral or vertical pressure. The sorest region around the antrum was the base of the zygoma. The first and third upper molars were missing. Roentgenograms of the second molar showed a normal periapical region. The restoration present did not involve the pulp. Pulp tests were normal. The second molar apparently was normal. It was not in occlusion. The tentative diagnosis was antral infection, and the patient was referred to his physician. The physician concurred in the diagnosis and referred the patient to an ear, nose and throat specialist. After examination, the antrum was reported negative.

Symptoms continued. As a prophylactic measure, the lower left infected third molar was removed. No pain or other symptom had been noticed, but roentgenographically the periodontal membrane showed some destruction.

At the onset of mandibular anesthesia, the patient commented on the immediate cessation of all pain and tenderness in the upper molar and antral region and stated that the region again felt normal. The lower molar was removed. No antral pain has recurred.

1214 Donaghey Building

PAIN IN THE JAW DUE TO HEART DISEASE

By Warren D. Stribling, M.D., and J. Willis Hurst,† M.D., Atlanta, Ga.*

A few patients with pain in the jaw due to coronary heart disease consult their dentists before they consult their physicians. Such an instance is reported.

A 43 year old man noticed a throbbing, aching, localized pain at the angle of the left side of the mandible. This discomfort increased in severity over a 24 hour period, and the patient, thinking he had an abscessed tooth, consulted his dentist. A careful examination revealed no cause for the pain. The patient continued to have severe pain in the same region during the next 48 hours, and a dental consultant was called. Another careful examination and additional roentgenograms disclosed no dental pathologic condition. Eventually the patient noticed chest discomfort and consulted his physician. A heart attack was suspected, and this was confirmed by the electrocardiogram.

The patient just described had pain in the jaw due to the most common form of heart disease—coronary arteriosclerosis. This disease is usually manifested as angina pectoris or myocardial infarction. The symptom angina pectoris is usually characterized by chest discomfort which is precipitated by effort or excitement and relieved by rest. This discomfort may radiate into the neck and into one or both arms. As a rule, the discomfort lasts less than 15 minutes and is relieved promptly by nitroglycerin. Myocardial infarction is usually secondary to coronary artery thrombosis, and the pain is more prolonged. This discomfort may occur at rest and may not be relieved by nitroglycerin. The discomfort of both angina pectoris and myocardial infarction may be felt in the jaw. In fact, pain in the jaw may dominate the clinical picture. Under these circumstances, the patient interprets his jaw discomfort as toothache and seeks dental advice. Roentgenograms and even tooth extraction may appear to be indicated.

However, when careful oral examination and roentgenograms fail to demonstrate a dental pathologic condition, when the jaw pain is bizarre and when it is associated with chest or arm discomfort, coronary artery disease should be considered.

Emory University, Atlanta, Ga.

*Trainee in cardiology, National Heart Institute.
†Assistant professor of medicine, Emory University.

A RAPID METHOD OF TEMPORARY REPLACEMENT OF ANTERIOR TEETH

By Robert C. Greiner, D.D.S., Albuquerque, N. Mex.

There are many methods of replacing extracted anterior teeth while a permanent restoration is being made. All these technics require considerable time. A rapid technic can be followed by which a replacement of the exact contour and color desired can be completed in approximately ten minutes.

1.. After the tooth is extracted, bleeding should be controlled by the placement of a hemostatic agent in the socket at the gingival level.

2. The extracted tooth is then taken to the laboratory and, with a Joe-Dandy disk, is sectioned at the cementoenamel junction. Thus the anatomic crown will be separated from the root.

3. A heatless stone is then used to smooth the cut portion of the crown so that it conforms with the gingival curvature.

4. The crown is then held firmly, and with a Joe-Dandy disk a groove approximately 0.5 to 1 mm. deep is made on the mesial and distal aspects, extending from the incisal edge to the cementoenamel junction parallel with the long axis of the crown.

5. The hemostatic agent is removed. The prepared crown is held in the patient's mouth in its proper position, and a drop of acrylic resin filling material is placed on the mesial and distal contact points. The crown need not be held after approximately one minute after placement of the acrylic resin filling material.

The acrylic resin flows into the grooves of the prepared crown and out onto the labial and lingual aspects of the adjacent teeth, thus providing necessary retention. If greater retention is needed, more acrylic resin can be placed into the undercuts both on the labial and lingual sides, between the replaced crown and the adjacent teeth.

The patient should be warned to protect the region by avoiding unnecessary biting.

If the crown needs to be removed for crown preparation on the adjacent teeth or for an impression for a partial restoration, this can be accomplished by removing some of the acrylic resin with a small round bur, either on the labial or the lingual aspect. The crown can then be removed by slight finger pressure.

To replace the crown, acrylic resin is added only to the region from which it was removed.

When there is no longer need for the temporary crown, and retention is fairly great, easy and quick removal can be accomplished by sectioning the crown with a Joe-Dandy disk through the middle from the labial to the lingual aspect parallel to the long axis of the crown.

116 Lansing Drive, S.W.

SEVERED VITAL TOOTH

By Leopold Hirsch, D.D.S., New York.

Roentgenograms reveal that a lower lateral incisor of an adult man is completely severed. The tooth is quite mobile. The patient received a traumatic blow more than 20 years previously. The tooth is vital and looks normal. It has been observed by the dentist for several years, and no changes have occurred.

Severed, vital tooth

600 West 181 Street

Malnutrition and Nationalism • The disadvantages of the food customs of impoverished Orientals have been emphasized in Western medical literature. The low-protein, low-caloric diet increases the spread of tuberculosis, decreases the resistance against most communicable diseases, favors the development of liver cirrhosis, transforms anchylostomiasis from a relatively harmless infestation to a dangerous disease. All this certainly clamors for correction and improvements. Nevertheless, the Oriental may also ponder the desirability of radical changes of the diet in the United States where, due to nutritional influences, so much gout, serious diabetes, obesity, gall stones, renal stones, amyloidosis, and premature coronary sclerosis occur. This might sound preposterous to our ears, but only because most people are adamant as far as their food preferences and aversions are concerned. No nation is willing to concede that its national diet may be lacking in certain important ingredients. The Occidentals are just as proud of their blatantly excessive food intake as the Orientals are of their semistarvation diets. *I. Snapper. Annals of the New York Academy of Sciences 63:92, 1955.*

Book Reviews

THE DENTAL TREATMENT OF MAXILLO-FACIAL INJURIES

By Sir William Kelsey Fry, C.B.E., M.C., M.D.S. (Durham), and Terence Ward, M.B.E. Second edition. 372 pages with 383 illustrations. Index. $9.50. Springfield, Ill., Charles C Thomas, 1956.

This authoritative textbook for the student and excellent reference work for the surgeon was first published in 1942, revised in 1945, and published in its second edition in 1956.

The general principles of diagnosis and treatment outlined are sound and generally accepted. Many methods of treatment are described, and the choice is left to the operator. The subject is logically and completely covered. The material is presented concisely. Words are carefully selected. Statements of fact and opinion are separated, and the author makes no attempt to evaluate controversial material. This method of treatment makes the book easier to read and more desirable as a reference work. Revised and added chapters on roentgenographic technic, anesthesia, antibiotics, diets, fractures of the middle third of the face and complications make this second edition an up-to-date work.

Many excellent color prints, photographs and drawings add to its value. Reproductions of roentgenograms are all positive copies rather than the negatives to which we are accustomed. This procedure is not unusual and is done for ease of reproduction but makes interpretation more difficult.

The format, printing, enamel stock paper and cloth binding are of exceptionally fine quality.

Paul C. Salisbury

THE PHYSIOLOGICAL FOUNDATION OF DENTAL PRACTICE

By L. L. Langley, Ph.D., and E. Cheraskin, D.M.D., M.D. Second edition. 587 pages with 192 illustrations. Index. $9.75. St. Louis, C. V. Mosby Co., 1956.

This volume is a textbook of physiology designed for dental students and practitioners. It emphasizes those aspects of physiology that particularly concern dentistry. The illustrations are original, for the most part; they are relatively simple and are helpful in clarifying the text.

Both authors are well trained in this field and have had more than adequate teaching experience. The text is clearly written, well organized and much improved in this second edition. It has been brought up-to-date and makes use of suggestions made by those who used the earlier publication. Each chapter is followed by a list of supplemental readings instead of the conventional bibliography.

There are in all 50 chapters divided into six sections: the nervous system, 158 pages; circulation, 148 pages; respiration, 40; excretion, 34; alimentation, 82; and endocrinology, 62. The publisher has cooperated effectively with respect to paper, printing and binding to make a useful and attractive volume.

Since there is some difference of opinion on the teaching of basic sciences to dental students, this book probably will not be universally acceptable. However, even those who do not agree with the authors' assumptions will find the volume worth reading.

Edward H. Hatton

THE AETIOLOGY OF IRREGULARITY AND MALOCCLUSION OF THE TEETH

By James Couper Brash, M.C., M.A.; H. T. A. Mc Keag, B.Dent.Sc.; James H. Scott, M.D., B.Sc., L.D.S., and Miriam L. Tildesley, M.B.E. Second edition. 503 pages with 225 illustrations. Index. Two guineas. London, The Dental Board of the United Kingdom, 1956.

An accurately documented and well-written textbook on the etiology of malocclusion of the teeth has been published in a second edition. Its authors have included literally every reference pertinent to the subject which has appeared in the literature of the last 100 years. The style of writing, clear, simple and interesting, makes the volume appropriate for both the serious student and the casual reader who might desire general knowledge in the problems of growth and development.

The authors deal with etiology because "the progress of medical science is in these days to be measured not so much by mere advances in the treatment of disease as by the extent of the knowledge—physiological and aetiological—which enables us to substitute a rational for an empirical basis of such treatment." The reviewer believes that

this approach holds for dentistry in general and for orthodontics more specifically.

This book is divided into two parts. The first part, written by Brash in a systematic fashion and well illustrated, discusses the factors which influence the etiology of malocclusion of the teeth. Much of the material in this section is historical and has been documented in numerous previous works on this subject, although not in as interesting a manner as it is here.

Twenty well-illustrated chapters, part two (Mc Keag and Scott), contain valuable material for the student of orthodontics as well as for the orthodontic clinician and diagnostician. The chapters on bone and muscle physiology will appeal to the student interested in the function of the stomatognathic system. The chapters on the various phases of normal and pathologic growth of the teeth in the growing face also deserve mention.

If this reviewer were to criticize any part of the book it would be the application to the human teeth and face of observations from animal experiments. Animal experiments may point up possibilities or experimental potentialities, but the actual data should come from the population to which a given growth disturbance or physiological phenomenon is attributed.

This book is a reference must for dental and medical libraries, for teacher, student and clinician.

Joseph R. Jarabak

PRESCRIPTION WRITING AND MATERIA MEDICA FOR DENTISTS

By L. Richard Cipes, Ph.G., D.D.S. Fourth edition. 620 pages with illustrations. Index. $9.50. New York, Dental Items of Interest Publishing Co., Inc., 1956.

As its title indicates, the emphasis in this text and reference work is on prescription writing, formulas and descriptions of drugs, rather than on pharmacodynamics and therapeutics.

Listings are encyclopedic and relatively uncritical. Many drugs of no significance in dentistry and little use in medicine are described. Examples are rhatany, formic acid and camphor water. On the other hand, many important newer drugs are omitted. Tetracycline, cortisone, erythromycin, nalorphine, chlorpromazine, meprobamate, levarterenol and propoxycaine are not listed in the index.

The nomenclature does not follow a uniform or entirely modern pattern. Trade names and generic names are employed in a random manner, usually without identification or explanation of their significance. This will not puzzle teachers of pharmacology but will be confusing to students and most practitioners.

There are many nonofficial formulas, some of which are unnecessarily complex and of doubtful rationale. Those for bismuth dentifrices are examples. Some of the titles include the words "L. R. Cipes" in parentheses.

On the favorable side, prescription writing, which dentists should cultivate, is stressed, most of the descriptions are well written, the typography is clear and the paper is good.

Donald A. Wallace

A SYMPOSIUM ON PREVENTIVE DENTISTRY

Edited by Joseph Muhler, D.D.S., Ph.D., and Maynard K. Hine, D.D.S., M.S. 266 pages with 11 figures and 18 tables. Index. $6.75. St. Louis, C. V. Mosby Co., 1956.

The prevention of dental caries, periodontal disease, malocclusion and oral cancer is presented in symposium form.

There are 22 chapters, each written by an authority. The first chapter explains the definition and scope of preventive dentistry; the last explains the contributor's ideas on how preventive dentistry should be taught in dental schools.

No criticism can be made of the factual material presented. These contributors are among the highest authorities on the subject. The contributions are supported by adequate bibliographies.

The library of any dentist would not be complete without this symposium, unless he had the complete writings of these 22 contributors.

The criticism of this reviewer has to do only with the suggestions or lack of them as to how this material could be used in the teaching and, therefore, in the practice of prevention of tooth loss.

In all dental schools the teaching of exodontics, crown and bridge and prosthetics consumes a major part of curriculum time, while subject matter of a preventive nature, that is, pedodontics, periodontics, malocclusion, nutrition and dental public health, is given what little time remains. And as the dental student is taught, so will he practice after graduation.

It is not essential that a dentist thoroughly understand the biochemical or other intricate scientific factors involved in the production of dental caries in order to prevent tooth

loss from this cause. If in school he is taught how to save teeth and given more clinical time for the practical application of preventive dentistry, he will save more teeth and construct fewer bridges and dentures in private practice. In this manner, he will merit to a greater degree, the title of doctor.

F. C. Cady

COMPLETE MOUTH REHABILITATION THROUGH CROWN AND BRIDGE PROSTHODONTICS

By Harry Kazis, D.M.D., and Albert J. Kazis, D.M.D. 392 pages with 551 illustrations on 332 engravings. Index. $15. Philadelphia, Lea & Febiger, 1956.

Part one of this book, 97 pages, discusses the theoretical basis of complete mouth rehabilitation with one chapter devoted to cephalometric appraisal.

Part two, 184 pages, consists of 25 case reports of overbites, attrition bites, end to end bites, prognathic bites and temporomandibular joint complications.

Part three, 61 pages, deals with operative and technical procedures in crown and bridge prosthodontics. The authors present a pantographic mandibular recorder of their own design, which is a means of recording and transferring the mandibular paths of function, determining balanced functional centric relationship and establishing proper vertical dimension. Thirteen pages are devoted to detailed technic for construction of a precision-attachment removable partial denture.

The large size type and fluent style of writing make this book pleasant reading, especially valuable to the practitioner interested in complete mouth rehabilitation through fixed and removable partial denture work. The binding and cover are of reasonably good quality.

Monte G. Miska

MANUAL OF ANESTHESIOLOGY FOR RESIDENTS AND MEDICAL STUDENTS

By Herman Schwartz, M.D.; S. H. Ngai, M.D., and E. M. Papper, M.D. 170 pages with 13 illustrations. Index. $4.25. Springfield, Ill., Charles C Thomas, 1957.

The authors have done very well with difficult and important material; they have included a tremendous amount in a comparatively few pages. A large portion of the text is devoted to the basic sciences, particularly the physiology of respiration and circulation. This treatment is advantageous, as it offers a ready review for the practitioner as well as for the student.

Every chapter, with but three exceptions —those on spinal, caudal and obstetrical anesthesia—is of definite interest to the dentist. Particularly informative, in addition to the chapters on the basic sciences, are those on intravenous anesthesia, complications of general anesthesia, pediatric anesthesia, local anesthesia, resuscitation and explosion hazards. The actual technics of administration are not discussed.

The material is presented in a manner and sequence that make for easy reading. Graphs and charts, although used sparingly, are helpful in clarifying and illustrating desirable points. This short book is a ready source of reference for anyone interested in general anesthesia.

Leonard M. Monheim

THE SHORTER OXFORD ENGLISH DICTIONARY

Prepared by William Little, H. W. Fowler, and J. Coulson. Revised and edited by C. T. Onions. Third edition, revised with addenda. 2,515 pages. Appendix. $25. New York, Oxford University Press, 1955.

This abridgement of the 13-volume *Oxford English Dictionary* was initiated by William Little in 1902 in accordance with one of the provisions of an agreement between the Philological Society and the Oxford University Press. First published in 1933, *The Shorter Oxford English Dictionary* presents in miniature all the features of the principal work.

"It is hoped," states C. T. Onions in a preface, "that both the student and the general reader will find in this work what they may reasonably expect to find in a historical dictionary of English compressed within 2,500 quarto pages, which covers not only the history of the general English vocabulary from the days of King Alfred down to the present time, but includes also a large number of obsolete, archaic, provincial, and foreign words and phrases, and a multitude of terms of art and science. In short, it is hoped that it may be found acceptable as a lexical companion to English literature. For those who possess the great Oxford Dictionary the 'Shorter' will serve as a key to its treasures, for those who do not it will form the only possible substitute."

The contents of the present volume are ordered as follows: The catchword is printed in heavy type, preceded where necessary by

a diacritic mark of the status of the word (obsolete, alien), and followed by the pronunciation in phonetic transcript, the notation of the part of speech, the indication of the modern currency of the word, a statement of variant spellings or inflexional forms, the indication of the earliest appearance of the word, its etymology, and the meanings (numbered or lettered), with specification of their status and with the date of their first appearance. Phrases, combinations and minor derivatives commonly form a block at the end of the article.

Authors and books cited are listed, as are abbreviations and signs, and a key to the pronunciation.

The type size is readable, the type page attractive, the paper is excellent and the binding adequate.

The Shorter Oxford, with its handy format, presents a quintessence of the vast materials in the larger work. *The Shorter Oxford* is one of the indispensable classic works of reference which should be available to every student, teacher, writer, editor and reader.

N. C. Hudson

THE BOOK OF KNOWLEDGE 1957 WITH YEARBOOK 1957, CHARACTER EDUCATION GUIDE, AND HOME AND SCHOOL STUDY GUIDE

E. V. MacLoughlin, editor. 20 volumes of the encyclopedia and three separate supplements. 8,107 pages with 7,592 illustrations and maps, some in color. Index. Appendix. No price listed. New York, The Grolier Society, Inc., 1957.

The average reader often finds it difficult to concentrate on any one subject. By a unique arrangement, this encyclopedia overcomes the problem. This seems to be one of its most valuable assets.

Although the contents of the set are divided into 18 main departments, not all entries of one subject are placed in one volume. Each volume contains one or more chapters on each subject. Therefore, the reader may study one subject, and, before his mind becomes tired, a turn of the page opens up another interesting subject. This unique arrangement is founded on sound educational principles.

Readers often avoid those fields of knowledge which seem dull, no matter how important they may be. The interesting arrangement of material induces the reader to study many fields. As a result, adults and children become more interested in the subjects which they previously have avoided. Such discoveries made by reading may lead to further exploration.

The editors of this encyclopedia, in collaboration with experts in many fields, make available to the reader the latest events in the story of mankind.

The simplest way to find any of the thousands of entries in *The Book of Knowledge* is to look into the general index which is in volume 20. There, each entry is listed in alphabetical order.

The most valuable achievement seems to be the excellent multicolored reproduction of America's historical documents such as the Declaration of Independence, the Constitution of the United States and the Bill of Rights.

The *Book of Knowledge,* although designed mainly for children, brings helpful information, entertaining and instructive articles for every member of the family.

The articles on subjects related to dentistry, however, should be improved.

Paul H. Glucksman

GUIDE TO MEDICAL WRITING

By Henry A. Davidson, M.D. 338 pages with 11 illustrations. Index. $5. New York, The Ronald Press Co., 1957.

Interesting cases, some of them even unique, are observed by every practitioner. Sharing these with others in the profession is a rewarding experience, Davidson points out, and in at least some instances, the information assembled can enrich the literature and lead eventually to better care of patients.

After that encouraging introduction, Davidson describes in detail how the potential author, with a new idea, a challenge of some general concept, or a treatment that he thinks holds promise, can organize his presentation so it will be understandable and stimulating to readers. There are chapters on writing form, how to get ideas assembled and clearly presented and how to revise the material.

Chapters on the handling of medical arithmetic, or statistics, and the presentation of case histories are especially helpful, as is the chapter dealing with prescriptions, in which conversion tables are provided. An important help in reference work that may be required is a classified list of journals published in English in each of the major health fields. More than 50 are listed for dentistry and oral surgery.

Additional guides for the budding author are provided on a sort of graduated scale, with a chapter on how to write an editorial as well as one on writing a book. Steps along the way

include learning to prepare abstracts and book reviews.

Practical throughout, the volume provides information on how to revise copy and read proof, and, finally, how to select the appropriate journal. It is encouraging that this sort of material has been assembled in so concise and informative a manner, and the volume can be recommended even for those who consider themselves accomplished authors.

William Bolton

DYNAMICS OF ORAL DIAGNOSIS

By E. Cheraskin, M.D., D.M.D., and L. L. Langley, Ph.D. 533 pages with 316 illustrations. Index. $16. Chicago, The Year Book Publishers, Inc., 1956.

The authors have divided this book into two separate parts. The first 300 pages are devoted to oral medicine and include brief descriptions of 200 oral diseases, arranged according to etiology. The second half consists of 200 pages giving a step-by-step diagnostic procedure covering the gross appraisal of the patient, examination of the head and neck and examination of the oral cavity. Particular emphasis is placed on the medical aspects of diagnosis; for example, the pulse is discussed for nine pages, while pulp testing receives one paragraph.

The book is concise, well printed and bound, and the illustrations are of high quality and carefully selected. The book is recommended as a useful teaching tool in a basic course in diagnosis. It will also be of interest to the general practitioner who wishes to be informed of current teaching concepts in this field.

Heyl G. Tebo

DEMAND FOR DENTISTS IN NEW MEXICO

By Vicente T. Ximenes. 59 pages. 3 tables and several illustrations. Appendix. Santa Fe, New Mexico Department of Public Health, 1957.

In this booklet an attempt is made to determine, separately for each county in New Mexico, the number of additional dentists required, if any, at the present time. In addition, an attempt is made to estimate the probable number of dentists needed for the entire state in 1975.

A formula is presented for calculating the number of dentists required in any county. The formula is based on the assumption that the percentage of persons living in a county who are "in the market" for dental care is determined by dividing the per capita income in that county by the per capita income in the county which has the highest per capita income (Los Alamos).

The booklet contains a considerable amount of economic and population information about the counties of New Mexico. Such information is of utmost interest to a dentist considering locating in the state. Of great interest also are the results of a survey conducted to determine how many dentists in New Mexico and Arizona would employ dental hygienists were they available.

Publication of this booklet points up the need for intensive, objective, valid studies of the supply of and demand for dentists within states.

B. Duane Moen

PRACTICAL EXERCISES IN DENTAL MECHANICS

By F. G. Shaw and D. C. Scott. Second edition. 205 pages with 250 illustrations. Index. $10. St. Louis, The C. V. Mosby Co., 1955.

This reviewer knows of no dental school in the country whose graduates would accept prosthetic appliances constructed by a technician trained after the manner suggested in this book. Its concepts are two or three decades behind the times.

Considering the obsolete technics which take up much of the space, the authors have handled the subject adequately.

Many of the chapters end with a list of "Do's" and "Don't's." These are concise and correct.

The bibliography at the end of the text is sketchy and is more a list for supplementary reading than for substantiation of the text.

The illustrations and tables are adequate. The type and style contribute to readability.

This book is not for the student technician in this country who hopes to work for or be of service to the modern dentist.

John F. Johnston

NEW AND NONOFFICIAL REMEDIES 1957

By the Council on Pharmacy and Chemistry of the American Medical Association. 607 pages. Index. $3.35. Philadelphia, J. B. Lippincott Co., 1957.

New and Nonofficial Remedies is published annually and constitutes the most concise and accurate summary available of therapeutic information concerning newer drugs.

The drugs described in *NNR* are generally those which have attracted the most attention. Most of them are of established value, but occasionally a drug which has not yet been adequately tested is included. Listing in *NNR* does not connote acceptance or endorsement. Mixtures are not ordinarily listed, it being assumed that adequate knowledge of the actions of individual drugs will enable the physician to predict the action of combinations.

The 1957 edition has been carefully reedited, as evidenced by numerous small but sometimes important changes in wording. There is a new chapter on antineoplastic agents. The 1957 edition is 42 pages larger than the 1956 book. The increase in size is caused mostly by the addition of descriptions of 42 new drugs. Among these are penicillin V, polio vaccine, two tranquilizers, four hypnotics, two adrenergic drugs and a topical anesthetic.

NNR is a valuable reference book for dentists, especially for those who are interested in the use of antibiotics, hemostatics or tranquilizers. The current edition should be in all dental libraries.

Donald A. Wallace

A TEXTBOOK OF OPERATIVE DENTISTRY

By William H. O. McGehee, D.D.S., M.D.; Harry A. True, D.D.S., and E. Frank Inskipp, B.S., D.D.S., Fourth edition. 720 pages with 423 illustrations. Index. $14. New York, McGraw-Hill Book Co., Inc., 1956.

Diagnosis, office arrangement and auxiliary personnel as well as all of the newer methods of tooth reduction are discussed in this comprehensive book. Cavity preparations, restorative materials and both direct and indirect technics for the construction of restorations are covered in sufficient detail.

This reviewer believes that too much attention is directed to the use of Dietrich's compound as an impression material for the indirect construction of inlays. Additionally, the reviewer's use of the technic advocated for the construction of Class V acrylic resin inlays generally has resulted in failure.

The authors are to be commended for including small sections on silicate cements and self-curing resins. The discussions of amalgam and gold foil restorations are adequate. The chapters devoted to inlay construction are stimulating.

The chapter on instruments and instrumentation and chair and operating positions is particularly good and can be of great value to both student and graduate.

Chapters 22 and 23 deal with pedodontics and endodontics in a penetrating and adequate way.

The illustrations are of such excellence that the book is especially recommended even though the reader might disagree with portions of the text.

John F. Johnston

THE DOCTOR AS A WITNESS

By John Evarts Tracy. 221 pages. Index. $4.25. Philadelphia, W. B. Saunders Co., 1957.

The interest in legal matters of the author's friends in the healing professions has impelled the author to write this book.

Tracy describes how a physician or dentist called as a witness should comport himself, what his privileges and obligations are and how he can best prepare to testify properly. Explanations provided about these various aspects are given clearly and simply, without confusing legal verbiage. For example, in a chapter titled "What Makes a Good Medical Witness," there is consideration of simple things that should occur to virtually everyone —although they probably do not—such as tone of voice, modesty, use of illustrative material, display of dignity and an honest attitude.

Other instructive chapters include one on opinion evidence and expert testimony, testimony on the issue of insanity, the conduct of workmen's compensation proceedings (including the history of such laws), and testimony in malpractice cases. There is considerable presentation of actual courtroom examples.

Without question, this volume will do much to allay fears of the practitioner who suddenly finds himself facing the prospect of being "dragged into court."

William Bolton

YOUR CHILD'S TEETH: A GUIDE FOR PARENTS

By Edgar S. Bacon, D.D.S. 124 pages with 8 illustrations. Index. $2.50. New York, E. P. Dutton & Co., Inc., 1957.

There is certainly a need for an easy-to-read, factual book for parents on the problems of dental health and, in particular, the dental health of children. The author has written an informative book. Its 21 chapters and question-and-answer section are well written and organized, printed in large type and well indexed. The style is similar to that of Dr. Spock's book on child medical care.

Although the author has done well to pioneer in this field, he has not handled the subject as well as it deserves. The book could contain a greater number of better-drawn, more graphic illustrations. In the light of our clinical knowledge, the chapter on the child's first appointment could be written with more clarity, particularly that part which deals with child management. The chapter on roentgenograms is not illustrated and could certainly be strengthened. The chapter on anesthesia for children, a major point, is dealt with in less than two pages, and mainly concerns nitrous oxide. This emphasis gives the reader the erroneous opinion that most work is done under general anesthesia. The subject of childhood mouth habits is, of course, controversial, and it is this reader's opinion that it should be attacked with more vigor and knowledge.

The portions dealing with clinical dentistry are inadequate. The portions dealing with dental health have been approved by the American Dental Association. Except for the chapters mentioned the author deals fairly well with his subject, which includes: teething, the first teeth, home care and remedies, the permanent teeth, nutrition and decay, malocclusion and orthodontics, and health programs.

Charles A. Sweet, Jr.

THE WORLD BOOK ENCYCLOPEDIA 1957

J. Morris Jones, editor-in-chief. 19 volumes. 10,500 pages with 20,000 illustrations, charts and maps, over 3,000 in color. Index. Reading and studying guides. Chicago, Field Enterprises, Inc., 1957.

Since the *World Book Encyclopedia* was first published in 1917, this reference work has met the most severe of all tests—to prove its dependability and usefulness for readers of all ages.

More than 1,600 contributors have cooperated to cover the branches of science and have helped to produce an outstanding reference work for nonscientists interested in the impact of science on the world of today.

The *World Book Encyclopedia* will stimulate further studying and reading. A determined and worthwhile effort has been made to simplify the vocabulary, to shorten sentences and to clarify concepts. The literature cited is in most instances up-to-date.

Seen as a whole, the *World Book Encyclopedia 1957* to which an annual supplement, reviewing the important events and developments of the year 1956, is added, is an admirable achievement. With its many illustrations, multicolored pictures, maps and artistic drawings, it is certainly one of the outstanding modern reference works. It is hoped that the publishers and editors will continue with this type of presentation.

Paul H. Glucksman

PROSTHETIC DENTISTRY: A CLINICAL OUTLINE

By F. Winston Craddock, B.A., M.S.D., D.D.S. 430 pages with 186 illustrations. Index. Appendix. $6. London, Henry Kimpton, 1956.

Undergraduate students and teachers will be interested in this book which deals with the making of complete and partial dentures, as well as with immediate dentures, splints, radium applicators, cleft palate obturators and the surgical preparation of the mouth.

The chapters are arranged so that the book may easily be used for two or more years of teaching.

The subject matter is treated adequately. The author does not give a rigid and unyielding technic, but allows room for the student to study and to think about the subject matter covered.

The paper and binding are of good quality, and the print is easily read. Many useful photographs and illustrations are employed throughout the text.

Joe P. Lambert

SIGMUND FREUD

By Alexander Mette, 80 pages with one illustration. Index. DM 4.80. Berlin, VEB Verlag Volk und Gesundheit, 1956.

True to its purpose, this publication, written to honor Freud's hundredth birthday, provides a wealth of information on the current position of psychoanalysis and its relation to the general sciences, psychology and psychiatry, pediatrics, education and literature.

But there is a sting, for the spirit of Freud haunts this Festschrift, ironically reminding the reader of many things which are still lacking today.

Several authors have attempted to prove that the age of Freud is nearly passed, that the influence of psychoanalytic thought is waning and that future psychologic research will be based more and more on the old and established standards of the classical psychology. Yet it is becoming increasingly doubtful whether the pressing tasks of our hysterical

times can be accomplished by stepping back into the past.

The author believes that an improved version of psychoanalysis, purged of some unnecessary features, may be required to reduce the current, world-wide tension and open the way to the next scientific period of mankind.

This book, written in excellent and comprehensible German, should help to correct the unreasonable fear of psychoanalysis that still lingers in the minds of many physicians and dentists, of scientists and of the general public.

The book is well documented, is of convenient size, complete and concise, and it should be useful to those readers who prefer to learn of Freud and the beginning and development of psychoanalysis in digest form instead of studying large and difficult textbooks.

Jean P. Lanion

THE DENTAL BUSINESS OFFICE

By C. Edward Rutledge, D.D.S., and Edward H. Winsor. 152 pages. Index. $3.50. Philadelphia, Lea & Febiger, 1956.

Rutledge and Winsor have given the dental profession one of the most useful and easy-to-read studies of a dental office in operation that has ever appeared in print. The compact, breezily written book is directed primarily to men in practice and offers practical and, many times, original solutions to the myriad of small problems that beset a practice. To read it is like sitting in on an informal clinic by some enthusiastic and obviously successful dentist who has explored all the possibilities for making a good dental practice even more productive and efficient.

Although it does not lay the complete background in the subject that is needed by the beginner (but is tedious to men already well-read in the subject), it does present a well-rounded and even penetrating analysis of the most important phases of office operation. The authors deal, in 14 chapters, with a good deal of relatively new material; for example, four chapters are devoted to group practice, the business manager, and the building to house such a project. The chapter on auxiliary personnel is extremely well done, and the chapter on recalls is the best that has ever been written on the subject. Even the sections on bookkeeping, machines, and equipment—ordinarily dull—contain many useful hints. Credits, collections, and financing are adequately treated also.

In short, the book is an important addition to a field in which a lot of excellent books have already been written. Its charm is its brevity and vigorous style; its value is its abundance of practical, down-to-earth detail.

W. N. Kirby

PEDIATRIC DENTISTRY

By M. Michael Cohen, D.M.D., and 16 collaborators. 607 pages with 395 illustrations. Index. $14.75. St. Louis, C. V. Mosby Co., 1957.

The 17 chapters in this book are well prepared, excellently illustrated and have adequate references at the end of each chapter. The volume should be of great assistance to all dentists accepting children in their practices.

Chapter 9, operative dentistry, although adequately illustrated, could be greatly improved by presenting the newer concepts in cavity preparation, pulpal protection and therapy in deciduous teeth.

Chapter 12, prophylactic orthodontics and tooth guidance, prepared by the author and Sidney I. Kohn, D.D.S., should receive special commendation for content, illustrations, and methods of treatment that will be helpful in reducing the incidence of malocclusion.

Other chapters, such as oral manifestations of systemic disease, and dental treatment for the handicapped child, will be of great assistance in diagnosis and in rendering services for handicapped children.

The book is recommended for student and practitioner.

Charles A. Sweet

BRITANNICA JUNIOR

William Benton, publisher. Walter Yust, editor. 15 volumes. 8,070 pages with 7,590 black and colored illustrations and maps. Index. Appendix. Chicago, Encyclopaedia Britannica, Inc., 1957.

"Let knowledge grow from more to more and thus be human life enriched" is the motto of the editors of this encyclopedia.

The essential qualities of an encyclopedia designed for use in both the school and the home are accuracy, readability and editorial organization. This encyclopedia meets these requirements and presents the material in a form that is interesting to children and adults.

A better understanding of the United States and of other countries was achieved by the use of maps which show the location of products and industries.

The ready reference index in the first vol-

ume serves to connect the reader in a matter of seconds with information desired. Most entries are alphabetically arranged.

The illustrative material and the large size type face provide not only simplicity but beauty in a style that makes possible the presentation of factual material in an inviting manner.

All in all, the *Britannica Junior* is a treasure chest of knowledge, ready at the reader's fingertips to be opened and unfold the lives of great personalities, the story of important inventions and the moving reports of historical events of the past and the present. The topics of dental interest, such as oral and dental hygiene, operative and prosthetic dentistry, oral infections, fluoridation and dental roentgenology, are well handled.

This set fulfills its purpose to entertain, to stimulate thought and to enrich the mind.

Paul H. Glucksman

DIE ZAHN-, MUND- UND KIEFER-HEILKUNDE: EIN HANDBUCH FÜR DIE ZAHNÄRZTLICHE PRAXIS (THERAPY OF THE TEETH, MOUTH AND JAWS: A MANUAL FOR DENTAL PRACTICE)

Edited by Prof. Karl Häupl, Prof. Wilhelm Meyer and Prof. Karl Schuchardt. For sale in complete set only. DM 650. Munchen-Berlin, Urban & Schwarzenberg, 1954-1956.

Issue 22 contains parts of volume III (General and Special Surgery of the Oral Cavity and the Jaws)

TREATMENT OF WOUNDS AND TRAUMAS • By Prof. Fritz Brosch. 34 pages with 18 black and white and 2 color illustrations.

The author of this article has been well known in the field of operative dentistry and oral surgery for almost half a century. He is a prolific writer, and the article is valuable to the professional reader. Its use for nonspecialists such as dental practitioners and students is limited, however, by the highly technical vocabulary and the lack of proper explanations, definitions and glossaries. The contribution contains a full discussion of the main subject and allied topics, including the history of wound treatment, treatment methods, disturbances of the healing process and antibiotic therapy. The illustrations are appropriate, except for some hazy micrographs. Interesting discussions of special treatment methods add to the value, but excessive arguments sometimes detract from its interest.

ANTIBIOTICS AND CHEMOTHERAPEUTICS IN ORAL SURGERY • By Prof. Rudolph Ullik. 15 pages.

In this rather short article, the author presents an introduction to recent antibiotic and chemotherapeutic treatment methods and estimates their contributions to oral surgery and allied branches of medicine and dentistry. This well-written treatise emphasizes the important trend in modern dentistry toward a more complete knowledge of the entire human organism and a better utilization of antibiotic and chemotherapeutic agents. Dentists who have not had a course in biophysics and who can read German should spend a few hours reading this book for information on these impressive developments. The scholarly standing of the author makes it safe to assume that future publication of an English translation will maintain the standard set by this valuable contribution.

OBJECT, PLAN AND MANAGEMENT OF SURGERY • By Prof. Karl Schuchardt. 23 pages with 10 illustrations.

This paper on surgical management, manipulation and minor oral surgery has been written with an emphasis on standard surgical principles and methods. The concise chapters and excellent illustrations explain the principles of managing surgical problems. First aid is described, technics for emergency and minor surgery are outlined, and there is a classification and evaluation of available instruments and the standard use of bandages and casts. Although not in the style of a textbook, this brief article is a practical and detailed outline which should aid dental practitioners and students. It should also be interesting reading for those with more extensive surgical experience. Some of the illustrations, especially those on armamentarium and instrumentarium, are excellent. Those who know the German language, who have visited German hospitals and have talked to leading German surgeons can attest that the author's presentation is precise. One can admire the zeal of the author who had the patience and industry to condense the literature of a generation into so useful an article.

PRINCIPLES OF GENERAL SURGERY FOR THE DENTAL PRACTICE • By Prof. Karl Schuchardt. 55 pages with 53 black and white and 2 color illustrations.

This excellent treatise is among the most comprehensive works of this kind ever to appear. In a wide exploration of medical and

dental literature on the relations between general surgery and dental practice, there are numerous quotations, not always distinguishable from the author's own opinion. The numerous illustrations are of the highest quality. Instruments used in general and oral surgery are described in detail, especially those favored by the author. The importance of preoperative examinations is stressed, and standards for judging success of surgery are considered. It is likely to be a long time before any other contribution on the relationship between general and oral surgery approaches the value of this article. The author has done a fine job of omitting the too heavy technical material, and he has presented an excellent treatise which is accurate in detail and extremely interesting.

CONTROL AND ELIMINATION OF PAIN • By Prof. Karl Schuchardt and Fritz Schön. 17 pages with 32 illustrations.

This article on anesthesia and analgesia is a valuable work. The arrangement of material falls into a well organized pattern. The authors attempt to bring German research up to date by including a good deal of material from work done outside Europe, especially the recent research conducted in the United States. The names of drugs described are, of course, mainly those used in Germany, and little attention is paid to the official pharmaceutical terms used in the other countries. The material presented is highly technical and theoretical; however, it should be of considerable interest to all dentists who want to learn other methods used in control and elimination of pain. The style is readable throughout, the illustrations self-explanatory, and this contribution can be recommended highly to those of the American dental profession who are able to read the German language.

Issue 23 contains parts of volume 1 (Anatomy, Physiology and Pathology) as follows:

PATHOLOGY OF THE TEETH OF THE DECIDUOUS AND PERMANENT DENTITION • By Prof. Wilhelm Meyer is concluded.

This article has been reviewed previously.

HEREDITARY ANOMALIES IN TOOTH NUMBER, FORM, AND STRUCTURE • By Asst. Prof. Christian Schulze. 31 pages with 16 illustrations.

The author has divided his article into three parts as follows: (1) diagnosis and prognosis, (2) the principles of genetics and (3) the applicability of different treatments. The hereditary factors, both dominant and recessive, are emphasized as is the relation between sex and the inherent pathologic and morphologic characteristics of oral disease. The article is accompanied by diagrams and tables. For dentists interested in the heredity of oral anomalies, this unusual presentation will prove an invaluable addition to a collection of cherished works. It contains valuable facts for the practicing dentist, the biologist and the sociologist as well as for the orthodontist and the oral surgeon with command of the German language.

This series makes a worthwhile addition to the library of all members of the branches of dentistry and of dental schools and hospitals.

Paul H. Glucksman

SCHWEIZERISCHES MEDIZINISCHES JAHRBUCH UND SCHWEIZERISCHER MEDIZINAL-KALENDER 1956 (SWISS MEDICAL YEARBOOK COMBINED WITH SWISS MEDICAL ALMANAC 1956)

By Dr. Med. Otto Leuch and Dr. Iur H. Egli. Two volumes, 1,016 pages and 60 illustrations. Index. 18.50 Swiss francs. Basel, Benno Schwabe & Co., Verlag, 1956.

These are two valuable books. The arrangement of material (mostly statistical) on the study and practice of general and specialized medicine (including dentistry, pharmacology and veterinary medicine) in Switzerland falls into a well-organized pattern, and the authors refer to work done outside of Switzerland and Europe.

The first book deals with biographies of Swiss scientists, antibiotic treatment, the modern treatment of urogenital tuberculosis, birth control and Freud's importance for present-day medicine. This material is followed by a register of all physicians, surgeons, dentists, pharmacists and veterinarians practicing in Switzerland, as well as by a listing and description of the Swiss medical and dental schools, public and private hospitals and clinics, organizations and associations, welfare and public health agencies, health and hospital insurance companies, and spas.

The second book lists drugs used in medical and dental treatment, unfortunately catalogued by their Swiss trade names; tables of maximal doses for adult and child patients; register of narcotics, anesthetics and opiates accepted by the Swiss medical and dental associations; causes and treatment of poisoning; symbols

and measurements of elements and alloys; tables of European linear, chain, square, dry, liquid and apothecaries' measures; obstetric data, and incubation period of the most important contagious diseases.

Although there is some inconsistency in the details presented, varying from a complete description to no description, both books can be recommended to students and practitioners who are interested in the present state of the medical sciences in Switzerland.

Both volumes are well written, attractively illustrated, neatly printed and adequately bound. Format, glossary and index are good, but the books lack sufficient reference material; the reference data are mainly drawn from Swiss publications.

Paul H. Glucksman

DIE KARIES DER ZÄHNE ALS KORROSIONSERSCHEINUNG: EINE ÄTIOLOGISCHE STUDIE (DENTAL CARIES AS A PHENOMENON OF ORAL TISSUE DECOMPOSITION: AN ETIOLOGIC STUDY)

By Ulrich Rheinwald. 166 pages with 54 illustrations. Bibliography. Index. DM 12.50. Leipzig, Germany, Johann Ambrosius Barth Verlag, 1956.

This monograph is issue number 39 of the series "Collection Meissner," which contains publications on German dental research. The series is edited by Prof. Eugen Wannenmacher.

Rheinwald's book is the summary of his own theories regarding the etiologic factors in caries. Even if the author, anxious to appear to be modest, emphasizes the purely hypothetical nature of his data, this study contains interesting details regarding recent knowledge of the complicated caries problem.

The small monograph is divided into the following eight chapters: (1) terminology used in caries research, tasks of dental research and theories on caries etiology (endogenous and exogenous causative factors); (2) different forms of caries development; susceptibility and resistance to caries; tooth substances; saliva, nutrition, and civilization as a causative factor; (3) tooth enamel; anatomicomorphologic structure; pulp vitality; chemical composition of tooth structures (organic, anorganic and crystalline); (4) initial stages of caries of the enamel (histologic and roentgenographic observations); caries of the dentin; decomposition of oral tissues as a cause of caries, and the effects of acids, bacteria and electrochemical forces; (5) chemophysical properties of human saliva; viscosity; carious processes in pulp, dentin and enamel; remineralization of tooth structures, and calculus formation; (6) the author's theories of caries etiology; (7) hypotheses of caries etiology by other scientists, and (8) caries prevention.

Despite the achievements in reducing the incidence of caries through organized preventive measures, fluoridation of drinking water is hardly mentioned in this book.

The author sought to understand the dynamics of the caries problem and, although his theories on caries etiology are highly controversial, if he succeeds in stimulating further research to solve the problem, his purpose will have been accomplished. The opinions of many German researchers are recorded but not discussed critically.

This booklet is adequately illustrated, well printed but poorly bound.

John P. Herrick

SOVJETSKOE MEDITSINSKOE REFERATIVNOE OBOZRENIJE. VYPUSK 8. STOMATOLOGIIA (A SURVEY OF SOVIET MEDICAL TREATISES. PART 8. STOMATOLOGY)

Edited by K. A. Moltshanova. 42 pages. Moscow, U.S.S.R. Medgiz, 1956.

This booklet was prepared by the State Publishing Department of Medical Literature (Medgiz). It describes the dental literature produced in the Soviet Union and published in the years 1953 through 1955. The book reviews 172 articles from the periodical literature (chiefly from *Stomatologiia*) and five books. It lists the titles of 80 dissertations accepted for the degree of Cand.Med.Sc.

The contents are divided into five sections. The first section deals with pathologic and functional disturbances in the oral cavity. The next section is concerned with the therapy and the prevention of oral diseases. Particular attention is given to periodontosis, for which the authors propose a new term: "amphidentosis." The reviews in this second section reveal that topical fluoride treatment has been made compulsory for all children in the Soviet Union. An anticarious paste formulated by Lukomski is used for treatment.

The third section covers publications on oral surgery. Much study has been done to improve the technics of plastic surgery and of other surgical treatments. Two case reports of rare diseases are described: botryomycosis of the hard palate and maduromycosis of the jaws.

The fourth section consists of articles devoted to orthodontics and prosthodontics. The

authors emphasize the importance of treating malocclusion. Considerable research apparently has been done on the acrylic resins used in dentistry.

The last section briefly describes the development of dentistry in some districts in the postwar period.

The five books reviewed are textbooks for dental students and postgraduate students.

This work is an interesting summary of dental technics, dental science and the practice of dentistry in Soviet Russia today.

Amalia Stauers-Bone

PRECIS D'ORTHODONTIES ET D'ORTHEPEDIE MAXILLO-FACIALE

By J. M. Chateau, M.D., and Michel Chateau, M.D. Second edition. 338 pages with 221 illustrations. Index. Appendix. Price not listed. Paris, Julien Prelat, 1956.

J. M. Chateau, professor at the French School of Stomatology and his son Michel, director of the dentofacial orthopedic department at the Eastman Institute in Paris, stress the importance of biological treatment in addition to mechanical treatment for correction of the respiratory and masticatory function and for esthetics.

They disapprove of the so-called universal type of appliance and recommend a selective method of treatment in accordance with a diagnosis and prognosis based on semeiotic observations coordinated with morphological, etiological and functional analysis of the pathologic conditions. Each chapter contains a list of pertinent references for more extensive reading and suggestions for research in specific cases.

This book is a summary of up-to-date orthodontics designed to aid the dental student in obtaining a better understanding of a specialized field and to prepare him for a more efficient cooperation with the specialists in preventive orthodontics.

J. de Wever

LA METHODE DE J. E. JOHNSON TWIN WIRE ARCH

By Paul Geoffrion, F.I.C.D. 174 pages with 110 illustrations. No price listed. Paris, Julien Prelat, 1956.

Johnson's twin arch method is analyzed in this clear and comprehensive monograph. The booklet is the result of the author's postgraduate courses given in Paris and Istanbul during the year 1955.

The work is divided into two parts. Part one covers the history, philosophy and development of Johnson's method. The author describes the instruments, parts and supplies required for the construction of the appliances and gives a step-by-step description of the technics for construction, insertion and maintenance. Excellent diagrams and photographs illustrate each step.

Part two analyzes the application of Johnson's methods to actual clinical cases. The author follows Angle's classification, and the treatment of Class I, II and III are covered in detail. Management of each class is described, greatest emphasis being given Classes I and II. All practical aspects of treatment are explained in minute detail with step-by-step description of the technics used. The case history method is used to great advantage, illustrating concretely the indications for each type of appliance.

The text is well written, and the captions of all illustrations are translated into English, German, Spanish and Italian. The photographs and diagrams are excellent quality. Their number and selection further contribute to the value of this work by giving it the appearance of a treatment atlas.

This is the first text of its kind exclusively dedicated to the twin arch method, and it is a worthwhile contribution to modern orthodontic literature. It is regrettable that no index is included for quick referral.

E. Baden

DIE GESTALTUNG DER TOTALEN PROSTHESE (THE CONSTRUCTION OF COMPLETE DENTURES)

By Carl Hiltebrandt. Second edition. 74 pages with 35 illustrations. Index. DM 6. Heidelberg, Germany, Alfred Hüthig Verlag, 1956.

In this rather small monograph, the author attempts to treat the subject of construction of complete dentures from the point of view of a clinician who interprets the significant, and individually different, conditions of the edentulous mouth before making a design.

This is a refreshing approach to the problem and one that should receive attention from practitioners as well as from dental schools. Construction of complete dentures should not be a purely mechanical procedure which can be turned over to dental technicians or laboratories.

The booklet is divided into five brief chapters on the following subjects: (1) the condylar course and the masticatory function, (2) determination of proper occlusion in the

edentulous mouth, (3) selection of artificial anterior teeth; (4) harmonious but not uniform arrangement of the teeth and (5) reason for failures in denture construction.

All discussions are brief and to the point. The booklet, bound in a convenient pocket size, should be of use not only to the dental student but to the practitioner who is faced constantly with the problems of diagnosing and evaluating the abnormal conditions frequently found in edentulous mouths.

P. J. Warren

LEITFADEN DER JUGENDZAHNHEILKUNDE: FÜR JUGENDZAHNÄRZTE, JUGENDÄRZTE UND STUDENTEN DER ZAHNHEILKUNDE (INTRODUCTION TO ORAL HYGIENE AND DENTAL CARE IN SCHOOLS: WRITTEN FOR SCHOOL DENTISTS, SCHOOL PHYSICIANS AND DENTAL STUDENTS)

By Hans Gebhardt. 56 pages with 5 illustrations. Index. DM 4. Berlin, VEB Verlag Volk und Gesundheit, 1956.

This booklet is intended to aid teachers, parents, school dentists and physicians in coping with problems which arise during periodic tooth examination and dental treatment of school children.

There are excellent chapters on the following topics: (1) history and development of school dentistry in Germany; (2) psychologic procedures establishing a favorable patient-dentist relationship; (3) caries prevention through fluoridation; (4) preventive procedures in pedodontics and orthodontics, and (5) cooperation between school dentist and school physician.

The author's approach to the problems of school dentistry is sensible. The booklet provides many lessons for the dental profession and may be read with profit by school dentists and dental students.

Paul H. Warren

BOOKS RECEIVED BUT NOT REVIEWED

DENTAL CLINICS OF NORTH AMERICA—SYMPOSIA ON I. NEW DEVELOPMENTS IN OPERATIVE DENTISTRY • By Drexell A. Boyd, D.D.S., II. DIFFERENTIAL DIAGNOSIS OF PROSTHODONTIC NEEDS • By Raymond J. Nagle, D.M.D. 332 pages with illustrations. W. B. Saunders Co., West Washington Square, Philadelphia, 1957.

DENTAL WÖRTERBUCH • 43 pages. Verlag Neuer Merkur, Clever Strasse 33, Koln, Germany.

DE ONTWIKKELING VAN DE ARTICULATOR VANAF ZIJN EERSTE VERSCHIJNINGSVORM • By A. A. D. Derksen. 52 pages with illustrations. Uitgave G. J. & D. Tholen, Utrecht, Netherlands, 1957.

ÉTUDES SUR LA PRÉCISION EN RADIODIAGNOSTIC—TECHNIQUES D'UN NOUVEAU CRANIOGRAPHE NOTATION ANGULAIRE DE L'INCIDENCE • By G. L. Dulac. 134 pages with illustrations. 1,300 francs. Masson et Cie, Editeurs, 120 Boulevard Saint-Germain, Paris, France, 1956.

EXPECTANT MOTHERHOOD • By Nicholson J. Eastman, M.D. 3 ed. 198 pages with illustrations. $1.75. Little, Brown & Co., 34 Beacon St., Boston, 1957.

PROBLEME DER FETALEN ENDOKRINOLOGIE • By Dozent Dr. H. Nowakowski. 225 pages with illustrations. Springer-Verlag, Reichpietschufer 20, Berlin, Germany, 1956.

L'ÉDENTÉ MOLAIRE TERMINAL ET SON TRAITEMENT PROTHÉTIQUE • By Docteur Henri Soulet. 83 pages with illustrations. Société Generale D'Impression, 61, Rue des Amidonniers, Toulouse, France, 1955.

HANDBOOK OF BIOLOGICAL DATA • By William S. Spector (Ed.) 584 pages. Wright Air Development Center, Air Research and Development Command, U.S. Air Force, Wright-Patterson Air Force Base, Ohio, 1956.

LEHRBUCH DER HYGIENE • By Prof. Dr. med. habil. K. H. Walther. 1,320 pages with illustrations. DM 58.—. VEB Verlag Volk & Gesundheit, Neue Grünstrasse 18, Berlin, Germany, 1954.

FLUOR-VOLLSALZ ZUR KROPF- UND CARIESBEKÄMPFUNG • By Hansjakob Wespi. 58 pages with illustrations. 4.50 francs. Benno Schwabe & Co., Basel, Switzerland, 1956.

DIE CHIRURGIE DES TRAUMAS: BAND I: ALLGEMEINE UNFALLCHIRURGIE; BAND II: SPEZIELLE UNFALLCHIRURGIE - ERSTVERSORGUNG UND FRÜHKOMPLIKATIONEN • By Prof. Dr. Maxim Zetkin and Doz. Dr. Ernst-Helmut Kuhtz. Band I, 741 pages with illustrations; Band II, 960 pages with illustrations. Band I, DM 52.—; Band II, DM 66.—. VEB Verlag Volk und Gesundheit, Neue Grünstrasse 18, Berlin, Germany, 1956.

Current Literature

ANTERIOR MEDIAN PALATINE CYST

Ira Jay Berlove. New York J. Den. 26:381 Dec. 1956.

Anterior median palatal cysts are congenital malformations resulting from the inclusion of the epithelium in the median fissures.

Diagnosis of cysts of the anterior palatine process is based on history, clinical judgment as to the proper size of a normal foramen and roentgenographic observations. Surgical technic for the removal of anterior median palatal cysts is explained, and a serious postoperative complication is described in which the patient used cortisone. Special precautions must be considered when cortisone is used. The patient should be observed frequently for the development of objectionable reactions and symptoms. Additionally, elective surgery should be deferred for approximately three to six weeks after use of the drug.

D. Lamar Byrd

CLINICAL SIGNIFICANCE OF THE "FURRED" TONGUE (KLINISCHE BEDEUTUNG DER "BELEGTEN" ZUNGE)

B. Gans. Umschau 56:666 Nov. 1, 1956.

The belief that the general health condition of a person is reflected in the state of his tongue dates from the days of Hippocrates. In the mind of laymen, however, this Hippocratic tradition has survived, more or less unimpaired, for 24 centuries.

Most mothers today still inspect their children's tongues, presumably to arrive at certain diagnostic conclusions.

In medicine and dentistry, the concept of the tongue as a trustworthy mirror of health and as a diagnostic aid has been losing ground steadily during recent decades.

The observation of furred tongues in healthy infants led to routine inspection of the tongue in older children. There appeared to be no relation between the condition of their tongues and a variety of diseases, the state of the tonsils, the nasal airway, the cervical glands or carious teeth, the appetite, or the state of the bowels.

The possibility of a positive association between a furred tongue and a given diagnosis arises only in (1) upper respiratory tract infection; (2) disturbances in the digestive system (constipation, hernia, feeding errors or worms); (3) cardiovascular disturbances (rheumatic heart, exocardial murmurs or congenital heart condition), and (4) pathologic conditions of the skin (warts, nevi, urticaria, alopecia and moles).

Any association between a furred tongue and emotional upsets, heart murmurs and oral diseases is purely accidental.

THE MANAGEMENT OF ABUSED ORAL TISSUES IN COMPLETE DENTURE CONSTRUCTION

Robert B. Lytle, Capt. (DC), USN. J. Pros. Den. 7:27 Jan. 1957.

Soft tissues that have been abused and deformed by ill-fitting dentures must be allowed to recover and return as closely as possible to normal form before impressions for new dentures are made. When patients who have been wearing complete dentures are examined for new dentures, all abnormalities of the soft tissues beneath the dentures must be treated. Causes of such disturbances may be either systemic or mechanical.

Evidence of mechanical abuse may vary from slight displacement to trauma and gross deformation. When dentures that have caused trauma and deformation of the underlying tissues are removed, the tissues improve in tone and return to more normal form.

The time necessary for tissue recovery is influenced by the general health of the patient. The changes occurring in tissue recovery may be observed and studied in several ways: clinically, from impressions made with a free-flowing material before and after tissue recovery, by use of the dental comparator, with roentgenograms and cephalometric roentgenograms.

Deformed soft tissues prevent the obtaining of proper jaw relation records. The prosthodontist must consider not only the pressure during the recording procedure but also the condition and form of the tissues at the time the records are made. The making of proper jaw relation records requires the use of stable record bases. In view of this, jaw relations should be secured the same day the impression is made, or, if this is not practical, the form of the soft tissues must be controlled either by resting the tissues before records are made or by temporarily relining old dentures.

Condition and form of the soft tissues has

significant bearing on establishment of freeway space.

Failure to obtain satisfactory results in the refitting of complete dentures can often be traced to changes in form of the soft tissues between time of impression and placement of the dentures. Complete dentures should be left out of the mouth for 48 to 72 hours before impressions are made for refitting dentures.

Cooperation of the patient can be obtained by careful explanation of the conditions that exist and the objectives sought. The hand mirror, study casts and roentgenograms are useful in this respect. The more the patient is taught about his oral condition the more cooperative he will be. The success of tissue recovery depends on the patient's cooperation, and the patient's cooperation is influenced by the prosthodontist's convictions as to the importance of the procedure.

The effect that the soft tissues have on the success of complete dentures cannot be overlooked. These tissues must be considered from the time the patient first appears for diagnosis until the final adjustment. Even after this, their health must be maintained if the ridges are to be preserved and the dentures are to function satisfactorily.

J. Dudley Powers

THE MODERN CONCEPT OF DISTURBANCES OF THE TEMPOROMANDIBULAR JOINT

G. Christensen. Australian D.J. 1:249 Oct. 1956.

Observations were recorded on more than 300 patients with symptoms of temporomandibular joint disturbances. Symptoms included acute and chronic pain in the region of the external auditory meatus, tenderness over the condyle during mandibular excursions, occasional occlusive deafness and, more rarely, giddiness and tinnitus. Clicking joints were usually symptom-free unless the click occurred at the beginning of the opening phase or at the end of the closing phase.

Roentgenograms of the joints were uniformly valueless. Most significantly, every patient had some degree of malocclusion, either premature contacts when the mandible moved from rest to occlusal position, or considerable cuspal interference during some mandibular excursion. Often the correction of these occlusal defects resulted in immediate relief of symptoms.

Where symptoms are acute, a basic plan of treatment should consist of: (1) complete examination and full mouth roentgenograms, (2) removal or adjustment of any occlusal disharmony by selective grinding, (3) a temporary occlusal splint if the vertical dimension, mandibular position and freeway space are at fault, (4) intra-articular injection of the joint with hydrocortisone acetate to reduce inflammation and give relief from pain and trismus until occlusal rehabilitation has been completed, (5) analgesics and local heat.

Where the condition is chronic, a similar plan is carried out. If there is loss of vertical dimension, this is corrected by means of new complete dentures, partial dentures, or bite-opening splint. If a cure cannot be effected, more radical treatment is necessary. Persistent clicking due to a relaxed, stretched or even torn temporomandibular ligament which allows excessive mobility of the condyle and an excessive anterior excursion in wide opening movements may be corrected by the Sutton-Taylor operation. This procedure involves turning down a flap of temporal fascia and using it to reinforce the lateral aspect of the capsule. The alternative is condylectomy, which is the only treatment where continued facial pain and tenderness over the condyle persists.

James Springer

RELINING OF DENTURES WITH SELF CURING RESIN

L. Castagnola and G. C. Chiarini. Schweiz. Mschr. Zahnhk. 66:997 Nov. 1956.

Denture reliners are useful where changes in the tissues have produced ill-fitting dentures. Since previous investigations have indicated that heat-cured resin will not give a satisfactory fit, the use of room temperature curing reliners has increased. Denture reliners are also of value after denture repair and when, for economic reasons, the immediate denture must serve as a permanent one. Denture reliners have the added advantage that repairs can be made in the presence of the patient in a relatively short time by simple technics. Any dimensional changes that occur on repeated polymerization of dentures at elevated temperatures are avoided.

The chemical composition of self-curing relining resins has shown little change in the last few years. The liquid is mainly methyl methacrylate. Odor and taste is often improved by suitable additives. The powder is methyl methacrylate polymer. Recently there has been a tendency to reduce the particle size of the powder.

This study revealed that adhesion of the relining material is improved by roughening

of the denture surface and moistening of the surface with monomer before application of the reliner.

The relining technic is described in detail. The denture should be scrupulously cleaned, and the surface of the portion to be relined should be roughened. Protection of the teeth and other parts of the denture is best accomplished by applying a coat of petroleum jelly. After the roughened surface has been wet with monomer, a thin coating of the still-fluid, relining dough is applied. After the relined portion has become dull, the denture is placed in the mouth and kept for one to one and a half minutes under slight pressure. Removal of excess polymer and the placing of the denture in lukewarm water for a short time follows.

The heat of polymerization may be uncomfortable to the patient, but it has not been proved harmful. It can be lessened by use of a minimum amount of reliner and by aerating the denture during hardening. Initially, the patient may feel some irritation since monomer may cause some damage to the tissue. Later damage to the mucous tissues may be caused by leaching out of residual monomer. Pathologic changes of the mucous tissues were not found to be significant histologically.

An extensive bibliography covering 40 references is included.

G. M. Brauer

SOME FACTORS DETERMINING THE EVALUATION OF FORCES IN ORTHODONTICS

K. Reitan. Am. J. Orthodont. 43:32 Jan. 1957.

Investigation of the forces which create problems in orthodontics reveals that some of the main factors to be dealt with are (1) the individual variation in tissue reaction, (2) the type of force applied and (3) the mechanical principles involved. These factors are closely linked. They can be discussed separately only to a limited extent.

During the initial stage of a tipping tooth movement obtained with continuous forces, cell-free, compressed regions are frequently created on the pressure side of the root even if the force applied is light. The time required for elimination of the compressed region by indirect bone resorption varies from around two weeks to three or four weeks, occasionally longer. The duration of an indirect resorption process is influenced by the length of the root; a short root is likely to entail a longer period of hyalinization. Intermittent forces of around 70 to 100 Gm. may produce hyalinized regions on the pressure side of the tooth moved, but these regions will be eliminated more quickly than when the tooth movement is continuous.

The force exerted in a tipping movement obtained with continuous forces will create compressed, cell-free regions in the periodontal membrane more frequently than will a bodily movement because of the mechanical principles involved. Direct resorption was observed in a torquing movement exerting 130 Gm. of pressure in the apical region.

The appropriate amount of force to be applied may vary considerably according to the type of movement required; approximately 250 Gm. is needed during the final stage of a continuous bodily movement of cuspids and only 25 Gm. in a movement of extrusion of individual front teeth.

William F. Ford

BLOOD CHEMISTRY—A DIAGNOSTIC AID IN DENTURE PROSTHESIS

J. D. Shriber, D.D.S. J. Pros. Den. 7:55 Jan. 1957.

Oral rehabilitation and the use of dental prosthesis have little chance of success if the dentist fails to remove the underlying basic cause of oral pathology.

First, the dentist should obtain a subjective history of the patient; is he or she being attended by a physician, and if so, what treatments or drugs are being given? Second, by suitable questioning, the subjective symptoms must be determined. Information obtained may indicate the need for a complete biochemical index test.

As the pathologic condition is reflected in the blood chemistry, a study of blood chemistry may lead to correct diagnosis and treatment. Treatment may include the cessation of intake of endocrine substances, high potency vitamins and other drugs. The elimination of refined sugar in the diet is especially suggested in the control of oral disease.

Jack S. Bishop

BRUXISM, DIAGNOSIS AND TREATMENT

Donald S. Moore. J. Periodont. 27:277 Oct. 1956.

Bruxism is one of the most important etiologic factors in production of periodontal disease. Causes of bruxism include tension, habit, hyperthyroidism, interference in occlusion, anger and inflamed periodontal membranes. Signs and symptoms which may reveal bruxism are abnormally developed muscles

of mastication, McCall's festoons, worn facets on teeth not touching in normal chewing excursions, recessions, sensitive root surfaces, temporomandibular disturbances, loss of alveolar bone and blanching of tissues under biting stress.

Damage that results from bruxism for any mouth depends on how much force can be applied by the muscles of mastication and the frequency and duration with which force is applied. Bruxism during childhood is not ordinarily a destructive process.

Treatment of bruxism in the past has not been easy. Correct diet, rich in calcium, phosphorus and vitamin B and D is important. Gastrointestinal disturbances must be overcome with the cooperation of a physician. Many patients lose the habit when the occlusion is equilibrated.

Tension as a cause of bruxism is the most difficult to overcome. Treatment consists of teaching the patient how to relax and providing the patient with a program for overcoming the tension. For those patients who are not successful in breaking the habit it is necessary to make an appliance for them to wear at night. Different types of appliances are used, depending on the individual patient. The correct diagnosis and treatment of bruxism is of paramount importance to patient and dentist.

Frank Trice

EFFECTS OF INTERNAL TREATMENT OF PERIODONTAL DISEASE WITH "BIOSTIMULIN" (OBJECTIVE ERFASSUNG DER WIRKUNG EINER INTERNEN PARODONTALTHERAPY MIT "BIOSTIMULIN")

Carin Fehr and H. R. Mühlemann. Parodontol., Zürich 10:152 Dec. 1956.

V. P. Filatow has shown that substances may be formed in living tissue after the tissue has been separated from the body. These substances, "biostimulin," may stimulate biologic processes when reintroduced into the organism.

During the last years, several authors have reported excellent results in the treatment of periodontal disease with local injections of human placenta extracts containing biostimulin.

In these experiments, however, the controls were not carried out concurrently. An unanswered question, therefore, remained, whether the results reported resulted from psychologic or pharmacologic causes.

At the Dental Institute of the University of Zurich, the effectiveness of placenta extracts (Biostimulin Berna) in periodontal therapy was examined in an experimental group of 27 patients and in a control group of 11 persons. The manufacturers prepared the drug from human placentas according to the method described by Filatow. The different types and degrees of severity of periodontal disease were distributed equally in both groups.

One month after local treatment (removal of calculus and other marginal irritations), and from two to three months after drug treatment, the PMA index was recorded, and the periodontium examined with the styroflex method and the electronmicroscope, evaluation of color photographs and tooth mobility measurements.

The styroflex method, aided by electronmicroscopy, permits a quantitative evaluation of the number of certain types of anaerobic microorganisms and of leukocytes present in a given region of the gingival surface.

Customary local treatment alone reduced the severity of the gingival inflammation in both groups when evaluated by the PMA index and color photography.

Electronmicroscopic examination of the impressions obtained with the styroflex method revealed no significant differences in the experimental group before and after local treatment.

Tooth mobility in the control group was reduced by local treatment alone by about 20 per cent within four months.

In the experimental group, which after local treatment during 72 days had received 14.7 injections of a total dose of 7.4 Gm. of placenta extract (biostimulin) per patient, the reduction of tooth mobility was similar to that in the control group receiving no injections.

Patients of the experimental group reported a spontaneous improvement in the periodontal condition and a feeling of improved general health.

No definite objective signs of an improvement in the periodontal disease were established clinically.

It must be assumed, therefore, that the successful results of the placenta extract (biostimulin) therapy previously reported had been caused mainly by the psychological effects of this time-consuming and painful treatment.

MOUTH PREPARATION FOR PARTIAL DENTURE SERVICE

Frederick R. Krug. New York J. Den. 26:385 Dec. 1956.

Factors to be considered in the construction of partial dentures may be divided into generalized factors and localized factors. Preliminary examination should include roentgen-

ographic survey of both arches, vitality testing of all remaining natural teeth, construction of accurate study casts and detailed clinical examination of the oral cavity.

Generalized considerations include systemic disturbances which could affect the oral tissues. These should be treated either by the dentist or by a physician prior to partial denture construction.

Localized considerations include residual roots, malposed teeth and abnormal bone formations, which require oral surgery. Other operative procedures include the restoration of all carious teeth, recontouring of natural teeth crowns for better design by judicious grinding and placement of inlays and crowns for better occlusal harmony.

Careful analysis of the study casts and roentgenograms will aid in clasp placement and preparation for rests.

In conclusion, mouth preparation for partial denture service involves a conscientious and critical appraisal of the anatomic foundation of the patient. A thorough evaluation before initiation of treatment, a clear and concise presentation to the patient of the problems involved and the completion of the indicated mouth preparation can mean the difference between success and failure.

The layman too often thinks that partial dentures are just a prelude to complete denture service. They need not be. In many instances where partial dentures precede complete dentures it is merely the result of inadequate treatment planning and application. The chances for an adequate and successful partial prosthesis are in direct proportion to the prepared foundation on which it is constructed and to the control of the stresses induced.

W. H. Meyer

OBSERVATIONS OF NECROTIZING GINGIVITIS IN 870 MILITARY TRAINEES

Harold E. Grupe and Lyndon S. Wilder. J. Periodont. 27:255 Oct. 1956.

Necrotizing gingivitis is a continual problem for the personnel of the Armed Forces. Two per cent of 622 newly inducted trainees had Vincent's infection. This study was based on 870 patients with Vincent's infection. Few presented subjective symptoms, and diagnosis was made on routine examination. Clinical signs were bleeding of gingiva and typical ulcers, especially at the tip of the papillae.

When symptoms were classical, a viral infection seemed to be superimposed on the fusospirochetal infection. A psychosomatic factor seems likely as a predisposing agent. Chlortetracycline and gum were applied locally. Application of tragacanth led to clinical healing; however, biopsies revealed a lack of complete epithelial repair. Follow-up treatment by tissue stimulation is necessary to induce complete healing and prevent recurrences.

Frank Trice

CURRENT KNOWLEDGE OF NUTRITION RELATIVE TO THE SUPPORTING STRUCTURES

Samuel Dreizen. J. Periodont. 27:262 Oct. 1956.

The supporting dental structures are sensitive to deficiencies of many of the nutrients which are essential for man. Repeated exposure to irritation causes breakdown of the oral tissues when necessary nutrients are not present. The resultant lesions may be acute, chronic, localized or generalized. Etiologic factors may be single or multiple.

Lesions are highly individualistic in pattern and rarely take the identical form in different patients. Deficiencies of borderline intensity or of short duration may occur without typical symptoms. Diagnosis of these conditions involves dietary histories, physical examinations and laboratory tests. Response to the introduction of a suspected absent factor confirms the diagnosis.

Frank Trice

THE RESULTS OBTAINED WITH AN UNEMBELLISHED GINGIVECTOMY TECHNIC IN A CLINICAL STUDY IN HUMANS

Irving Glickman. J. Periodont. 27:247 Oct. 1956.

Two hundred and fifty patients with chronic periodontal disease of varying degrees of severity were treated by gingivectomy. All patients were treated by the same individual and were under observation for periods of from three months to seven years.

A modified Kirkland gingivectomy technic was used for all patients. After an eight to 12 week period, the gingiva was observed and found to be a healthy, pale pink with rounded, knifelike adherent margins. The results indicated that a gingivectomy technic involving (1) resection of diseased pocket wall and (2) removal of calculus and smoothing the root surface, performed in one operation, and followed by application of a periodontal pack

was an effective and dependable method for eliminating the wide variety of pockets seen in the 250 patients. The restoration of esthetically and functionally desirable gingival contours ordinarily can be achieved without the use of drugs, preliminary scaling or so-called plastic procedures.

Frank Trice

EFFECT OF ZINC PHOSPHATE CEMENT FILLINGS ON GINGIVAL TISSUES

Jens Waerhaug. J. Periodont. 27:284 Oct. 1956.

This study was a link in a series of experiments set up to evaluate the effect on gingival tissues of different materials used in dentistry. In 11 teeth in three monkeys and one dog, zinc phosphate cement fillings were inserted in cavities prepared to the bottom of the clinical pocket.

After 82 to 338 days, an approximately normal epithelial cuff was formed in limited regions. The cement seemed to exert a slight irritation of chemical nature. Crevices of various widths were always found between the filling and tooth. In these crevices, degenerated cells or bacterial plaques were found which caused inflammation in the adjacent tissue.

Frank Trice

THE AGE FACTOR IN DENTOGENICS

John P. Frush, D.D.S., and Roland D. Fisher, D.D.S. J. Pros. Den. 7:5 Jan. 1957.

The goal of the dentist is to help the patient maintain a favorable relationship between his chronological age and his physiologic mouth condition. Although complete edentulousness is more frequently encountered with advancing age, it is possible for the condition to occur early in life.

The objective of the age factor in dentogenics is to guide the prosthodontist in his efforts to maintain a high degree of conformity between his restoration and the patient's physiologic age.

There is beauty in advanced years as well as in youth. In the advanced years an additional quality of dignity is added to beauty. The maintenance of this dignity is the responsibility of the prosthodontist. Natural teeth in the youthful individual have a lightness of shade and forms characteristic of newly erupted teeth. In the older person normal wear and trauma, and, in some instances, malocclusion and disease, make inroads upon the original tooth form and shade.

Grinding of the incisal edges and removal of the incisal enamel to various inclinations and depth will suggest age and wear and convey reality to the denture.

Erosion, imparted to the artificial tooth by careful grinding and repolishing of the ground surfaces, conveys the illusion of vigor and advanced age.

The positioning of the teeth in the matrix is important, in that imperfection is an artistic requirement in creating the illusion of natural teeth. The correct use of diastema between the artificial teeth gives the dentist opportunity to create successfully the illusion of reality.

Interpretation of age in the matrix material can be accomplished by observing the color of the tissue in the mouth and using the lifelike matrix materials available. Characterization, such as may be produced in this manner, opens up an entirely new field of artistry to the observing dentist and an opportunity to rehabilitate the mouth of the edentulous person in such a realistic manner as to maintain true identity between the dental restoration and the sex, personality and age of the patient.

Joe P. Lambert

ARCH WIDTH IN THE PREMOLAR REGION—STILL THE MAJOR PROBLEM IN ORTHODONTICS

Ashley E. Howes. Am. J. Orthodont. 43:5 Jan. 1957.

The importance of arch width in orthodontics bears stressing. In the present study the records of 232 patients were tabulated, noting the extremes and means of 26 factors.

Included were maxillary and mandibular measurements of tooth material, coronal arch width in the first bicuspid region, basal arch width in the first bicuspid region, basal arch midline length, and percentage relationships of arch width and length to tooth material.

It was concluded that a high percentage of persons with irregular or crowded teeth have a greater than average amount of tooth material, and a still higher percentage of such persons have a less than average arch width in the bicuspid region. Nearly all persons with crowded teeth have insufficient arch width in the bicuspid region in proportion to their tooth material and nine of ten persons with malocclusion have abnormal balance of the musculature which surrounds the denture,

a condition which produces procumbency of the anterior teeth and possibly influences arch width in the bicuspid region.

By taking advantage of additional anteroposterior growth through the use of an extraoral retractive force, it is possible to move the teeth distally or hold them back while forward growth occurs. Either way, additional basal arch width is afforded for support of the teeth.

Increasing of the arch width is more feasible when treatment is started in the deciduous or mixed dentition and continued through the period in which the bicuspids erupt.

There would appear to be some correlation between arch width and length and the mandibular plane angle; those persons with steep planes generally having narrower and shorter arches. This correlation may be only coincidental, with other skeletal factors often associated with the steep mandibular plane being of greater importance than the mandibular plane itself in producing narrower, foreshortened arches.

Sound orthodontic judgment of the immeasurable factors involved in malocclusion remains the prime requisite in making decisions as to whether to attempt arch enlargement or to reduce the amount of tooth material by extraction.

William F. Ford

HEALTH EDUCATION IN RELATION TO DENTAL CARE NEEDS AND DEMANDS IN THE ELGIN-ST. THOMAS HEALTH UNIT AREA

C. I. Coburn, D.D.S., D.D.P.H., and R. M. Grainger, D.D.S., D.D.P.H. J. Canad. D.A. 23:5 Jan. 1957.

Eleven years ago, a dental health education program was instituted. Its object was to demonstrate the practicability of public education in the prevention or control of dental defects. The dental health program in the Elgin-St. Thomas area was begun in 1951.

Elgin county has a population of 55,000, mostly of English, Irish or Scotch origin. The water of the northeast section of the county contains natural fluorides in optimal amounts. The dental facilities are concentrated in St. Thomas (the county seat), and the over-all ratio of dentists to population is 1:3,000.

Two important factors in the program required attention: (1) participation of the dentists was vital to success, and (2) the effectiveness of instruction in dental care in the schools needed study.

Various means were devised to make dental health education more palatable, such as selected film strips, essays prepared by pupils and participation type experiments. Interest of the teachers and of the health unit personnel was indispensable.

Some conclusions arrived at were: (1) more children have had dental care since the program started because of the demand created; (2) a significant decrease in the caries attack rates over the four year period of the educational program suggests its value; (3) as a result of figures obtained, it seems benefits of fluoridated water may be largely lost if dental treatment is neglected for those cavities which are present.

Theodore C. Levitas

RE-EVALUATION OF THE CANTILEVER PRINCIPLE

Joseph E. Ewing, D.D.S. J. Pros. Den. 7:78 Jan. 1957.

In the past, little attention has been given to the cantilever bridge, which is an excellent compromise with the use of the much-preferable fixed bridge.

A careful physiologic appraisal must be made, predicated on the following:

1. The periodontal membrane must be evaluated carefully. The total periodontal membrane region of the abutment teeth should equal or exceed that of the teeth to be replaced.

2. It is essential to have a normal amount and distribution of alveolar bone, preferably surrounding the root completely. The trabeculae should be considered also.

3. Favorable root length, shape and crown length are needed.

4. Favorable arch-to-arch relationship also is required. The most favorable occlusal apposition is mucosa-borne.

5. Tooth-to-tooth relationship must be favorable. The deep vertical overlap is neither favorable nor acceptable. Functional demands of the patient must be kept within normal range. Full-metal veneer crowns are preferred as abutment attachments. The inlay should not be used as a major abutment attachment. The axioproximal grooves must be made as deep as possible; a lingual pin may even be utilized.

Clinical experiences have proved conclusively that the cantilever principle can be employed both in the anterior and posterior sections of the mouth. Replacement of upper and lower central and lateral incisors may be cantilevered, depending on the situation. The cuspid replacement usually needs a double

abutment of both bicuspids, and sometimes the molar must be used.

Application of the cantilever bridge in posterior regions should not be carried out on any large scale; however, in certain instances, it may be used. A patient with the complete upper denture against natural dentition which extends from second bicuspid to second bicuspid, inclusive, provides a desirable situation. Both bicuspids may be used as retainers to cantilever the first molars posteriorly.

This principle may also be utilized in unilateral posterior extension when the molars are missing. When the upper or lower second and third molars are missing, a pontic, reduced one-third mesiodistally and buccolingually, may be cantilevered. Since the first molar offers the greatest area of periodontal attachment, there should be no hesitation in using it for application of the cantilever principle. After insertion of cantilever bridges, occlusal balance must be present.

Charles J. King

THE PROFESSIONAL MAN'S EXTRA INCOME TAX BURDEN

Milton R. Culbert, D.D.S. J. Canad. D.A. 23:11 Jan. 1957.

Although some regard a trade union and a professional guild as poles apart, they are, in essence, the same, in that they are a banding together of workers of a calling. A major difference, however, is that at meetings the professional man spends most of his time trying to improve his skill while the trade unionist spends most of his time at meetings trying directly to improve his income and personal benefits.

A major result of this difference is that the trade unionist has gained a position of privilege and freedom from responsibility with such benefits as vacation with pay and pensions. The fact that the professional man may be high on the income scale is largely overcome by the fact that he is also high on the income tax scale, paying higher taxes than people in industry earning comparable wages in shorter hours. Inequalities in the Canadian tax laws specifically affect the professional man; the professor or teacher has a particularly difficult time under existing laws.

The government is aware of these conditions, but politicians will hardly consider a petition which represents a few hundred professional men as compared to similar requests from unions representing several hundred thousand workers.

Because of idealism, the professions have not armed themselves with bargaining powers. Unless they learn how to defend themselves in this economic struggle, the cost of professional services will soar, and teachers and students will become still scarcer.

Present day conditions demand that professional bodies devote time to the study of their own protection in order to cope with social, economic and political pressures.

Theodore C. Levitas

THE PROFESSIONAL MAN AS A CITIZEN

Donald Fleming, B.A. J. Canad. D.A. 23:1 Jan. 1957.

The professional man cannot escape from community life and the ensuing responsibilities.

Factors which obligate the professional man to carry responsibility include: (1) his incurrence of a debt to the public by virtue of his education; (2) the respect he should have for learning and science; (3) the high esteem he has for his own profession; (4) his primary motivation to help those in need of the services he is able to render; (5) the sense of interdependence between him and his fellow practitioners and (6) the ethical standard which, actually, is the ultimate distinction of the professional man.

He owes a duty to the public and cannot look down on public service as being beneath him since public service must accomplish the things which cannot be done by individuals. Democracy suffers from the evils of cynicism and indifference, and it rests with the professional man to do more than his share in paying the debts of society.

Theodore C. Levitas

INSERTION OF IDENTIFICATION MARKS IN ACRYLIC DENTURES (KENNZEICHNUNG VON KUNSTSTOFFPROTHESEN)

Paul A. Hathorn. Zahnärztl. Praxis 7:10 Dec. 1, 1956.

Identification marks bearing the patient's name and other data should be inserted in acrylic resin dentures at the time they are made if these marks are to remain legible and permanent.

The following technic produces satisfactory results in dentures which have a favorable area and contour on the tissue-bearing surface for reception of such identification marks.

The name and other data are typed on white tissue paper. The writing should be con-

densed into as small an area as possible; preferably two lines for name and number. If the patient's name is unusually long, the last name only or the initials will be sufficient. Black or red ribbons can be used. Black typing produces greater contrast and better legibility but red typing is less conspicuous and does not cast dark shadows visible through the denture base. The paper slip should not be larger than one inch long and 5/16 inch wide.

Because of variations in surface contour, the position of the insertion should be selected carefully. It should be placed on the tissue-bearing surface to avoid skidding after closure of the flask. In upper dentures, the identification mark should be placed in the region of the posterior palatal foramen, and in lower dentures on the inner surface of the posterior buccal flange. If tin foil is not used on the cast for separation in processing, the immediate area of the cast opposite the inserted identification mark should be faced with tin foil to prevent cloudiness in the clear acrylic insert which covers the identification slip.

After the first trial pack of acrylic resin denture base material in the processing flask, a piece of the clear acrylic sheet is cut out slightly larger than the mark. The identification mark is then placed in the desired position on the exposed tissue-bearing surface of the freshly packed acrylic resin. The slip is moistened with a few drops of acrylic monomer and the small wafer of clear acrylic is placed over it. When the flask is cooled for the second trial pack, the identification mark, covered by the acrylic resin wafer, is pressed into the denture base material, and the surface will be flush with the surrounding material.

After completion of the denture construction, the name inserted appears clearly under the covering acrylic resin wafer which serves as a transparent window and protection for the identification mark.

RESPONSIBILITIES OF OFFICIAL HEALTH AGENCIES IN DEVELOPING GROUP PAYMENT DENTAL PLANS

Nathan Sinai, Dr.P.H. Am. J. Pub. Health. 47:39 Jan. 1957.

As early as 1939 professional and lay organizations were planning prepayment of medical services. Health officials were advised to participate in planning in order to provide more facilities and medical services to the public. Prepayment dental programs were endorsed about 16 years ago, but they have not been used to any great extent. Some people have doubted that dental services were insurable. However, prepayment projects have begun for children in the states of Washington, Oregon and California.

Endorsement by public health agencies has a place in the development of prepayment dental programs, but this role is minor as compared to the potential contribution. Official health agencies in various sections of the country have conducted studies which provide sound information for the development of these programs. The Council on Dental Health of the American Dental Association gave strong endorsement to these studies. Because public health groups have experience in organizing and administering community programs, they must expect to help plan organization and administration of these services.

The same problems that confronted the medical profession in the early stages of prepayment medical care are being seen in the development of prepayment dental programs.

The responsibility for educating the public is an accepted function of official health agencies. Another responsibility is to learn what percentage of the child population must participate in the program for it to be successful. This study should be a joint function of health agencies and sponsoring corporations.

Having had experience in testing different methods for providing dental services for children, public health dentists can offer valuable assistance. Although dental prepayment is new, it can be effective if sponsors and official health agencies use the vast information available from previous experience in public health, dental programs for children and the experiences of hospital and medical prepayment plans, in planning, organization and operation.

Since official health agencies are charged with the responsibility of improving the health of the people, they can and should become an important part of dental prepayment programs. This is especially true in the organization, administration and evaluation phases of the programs.

John E. Chrietzberg

DIAGNOSIS OF COMMON LESIONS OF THE ORAL CAVITY

Robert B. Shira. J. Oral Surg. 15:95 April 1957.

Dentists are capable of identifying the common soft tissue lesions found in the oral cavity. Many types of lesions are encountered, ranging from congenital abnormalities to true neoplasms. Some are common, others relatively rare. Some require treatment whereas

others are important only from a diagnostic standpoint.

The clinical appearance of some is so characteristic and constant that diagnosis can be made with certainty by the experienced clinician. In others the characteristics are so nonspecific that a diagnosis from the clinical observations alone is speculative at best. In dealing with the latter group, or any other soft tissue lesion in which the diagnosis is in doubt, the role of the histologic examination cannot be overemphasized as an aid in proper diagnosis.

The common soft tissue lesions may be roughly divided into four categories—those of congenital or developmental origin; those producing change in the color, contour and texture of the mucosa; those characterized by vesicle formation and those resulting from tumorlike proliferations and true neoplasia. There is some overlapping in these arbitrary divisions, but they form a practical approach to the description of the lesions.

In the diagnosis of soft tissue lesions of the oral cavity, the dentist should be alert for malignant conditions, not because they are common, but because they are so serious. Although many older and larger malignant tumors are easy to diagnose, the characteristics of the early or incipient malignant lesions are usually so vague that they are frequently overlooked or passed off as being of no consequence. In dealing with any lesion in which the clinical characteristics are not specific, it would be wise to consider the lesion malignant until proved otherwise.

If the dentist could diagnose malignant lesions before they develop their classical characteristics, or if he could discover oral malignant lesions before he as the clinician even suspects them of being malignant, then great forward strides would be made in the early detection of malignant change that is so essential to control of the disease. Extensive use of biopsy is required to establish a positive diagnosis for many of the lesions, but such a procedure is to be encouraged. The procedure is particularly needed in dealing with any nodular, ulcerated or indurated lesion that does not respond to recognized therapy in a limited period of time.

CHRONIC SCLEROSING OSTEOMYELITIS

William G. Shafer. J. Oral Surg. 15:138 April 1957.

Chronic sclerosing osteomyelitis represents a reaction of bone to injury which commonly occurs in the jaws. Both focal and diffuse forms are recognized, with the focal type of osteomyelitis being exemplified by that condition called "condensing osteitis." Diffuse chronic sclerosing osteomyelitis occurs predominantly in middle-aged or elderly persons and appears to result from a slowly progressive, mild, chronic, nonspecific infection of bone causing stimulation rather than destruction. The disease may be discovered during routine roentgenographic examination of the jaws, or vague clinical symptoms may cause the patient to seek treatment. Because of the diffuse nature of the disease, no definitive treatment can be offered, although antibiotic therapy is indicated during acute exacerbations which occur occasionally.

SAFEGUARDING BIOPSY BY USE OF ELECTRONIC ELECTROSURGERY

Maurice J. Oringer. J. Oral Surg. 15:129 April 1957.

Cancer therapy to be effective must be ruthlessly thorough. Preservation of life itself supersedes cosmetic or functional considerations. Preoperative conclusive diagnosis of malignancy therefore is imperative.

Students of cancer appear universally agreed that although age, history of lesion, subjective symptoms, roentgenologic and blood evaluations and clinical observations are all valuable aids, biopsy is essential for conclusive diagnosis of malignancy, and that biopsy surgery entails two potential dangers. Precancerous lesions may become activated to malignant change, and malignant neoplasms can be stimulated to metastasis through the hematogenous or lymphatic channels. They further agree that these dangers usually result from inexperienced manipulation rather than from the surgical procedure properly carried out.

Despite statistical incidence of oral cancer, clinically it is relatively uncommon. Many general practitioners never encounter it in a lifetime of dental practice. Because of unfamiliarity with oral malignant neoplasms and biopsy procedures, the average general practitioner is usually unqualified to attempt removal of tissue for biopsy.

When the general practitioner diagnoses oral cancer, he can best complete his service by refraining from inexperienced attempts to obtain tissue for biopsy and by referring the patient to a competent specialist for conclusive diagnosis.

Electrosurgical biopsy is accompanied by tissue coagulation that effectively seals off hematogenous and lymphatic channels for dissemination of tumor emboli. Electrocautery and spark-gap electrosurgery usually produce excessive tissue coagulation, thereby jeopardizing the diagnostic value. Electrosection, pro-

duced by ultra-high frequency electronic equipment, cuts tissue by molecular dissolution without pressure or manipulation; accompanying marginal coagulation effectively seals off avenues of metastasis without impairing diagnostic value of the biopsy specimen (demonstrated by photomicrographs), thereby safeguarding biopsy surgery.

Failures due to faulty technic or improper equipment should not be permitted to detract from the ability of electronic electrosurgery when properly employed to provide a safe, efficient method for taking biopsy specimens diagnostically comparable to the best obtainable by other surgical methods.

AMELOBLASTOMA OF THE MANDIBLE: REPORT OF CASE

Charles C. Alling. J. Oral Surg. 15:150 April 1957.

A 52 year old woman had noted over a two year period an increase in the size of the left lateral aspect of the mandible near the angle. The region was incised and drained by a physician, and when no reparative response of the tumor ensued, roentgenograms were obtained. The report from the roentgenologist indicated either a carcinoma or sarcoma as the differential diagnosis. The patient was then referred for oral surgery.

Roentgenograms obtained prior to oral surgery disclosed an expanding multilocular lesion just anterior to the angle of the left side of the mandible. The lesion had eroded the alveolar margin at its superior aspect and the cortex on the lateral surface of the mandible.

Under local anesthesia the lesion was approached intraorally; the firm, grayish-white lining membrane was enucleated. The bony defect was flushed with cauterizing phenol solution, and the region packed open to the oral cavity with petroleum jelly gauze. The postoperative course was quiet, and the pathologist's report was "ameloblastoma . . . both solid and cystic." One year postoperatively, clinical and roentgenographic examinations showed normal osseous architecture with nothing to suggest recurrence of the ameloblastoma.

This case emphasizes that while ameloblastoma has a noticeable tendency to recur, and some surgeons advocate resection-type surgery, there is a school of thought favoring conservative surgery as a first consideration. Although a diagnosis of ameloblastoma may be indicated on the history and clinical roentgenographic examinations, the final diagnosis must await histologic verification. Because of the ameloblastoma's tendency to recurrence, the need for long-term postoperative observations is stressed.

STAINLESS STEEL BONE ONLAY SPLINT FOR IMMOBILIZATION OF DISPLACED CONDYLAR FRACTURES: A NEW TECHNIC

Arthur E. Smith and Marsh Robinson. J. Oral Surg. 15:164 April 1957.

In the past the immobilization of the fractured mandibular condyle after open reduction has been difficult for oral surgeons. An improved method of designing and constructing an individualized stainless steel splint has been developed. Three cases, one with a ten and a half year follow-up, are presented to show application of this new technic.

The metal used in this splint is relatively nonelectrolytic, nonmagnetic, noncorrosive, nontoxic and causes negligible tissue reaction. Fractures immobilized by this method heal in a normal position. Many of the dangers involved in former procedures are greatly reduced or entirely eliminated. These dangers include: nonunion, healing in malposition, the interposing of soft tissues at the fracture site, a stormy postoperative course, injury to the facial nerve, malocclusion with lateral mandibular deviation, future prosthetic problems and temporomandibular joint pain.

TONGUE GRAFTED TO DENTAL PULP AS A COMPLICATION OF JAW FRACTURE: REPORT OF CASE

W. R. Roberts. J. Oral Surg. 15:162 April 1957.

A nine-year old child received intermaxillary fixation for fracture of the mandibular symphysis. On removing the tie wires after 16 days, it was found that the tongue had become grafted to the exposed pulp of a maxillary deciduous molar. The pedicle connected the tooth pulp to the tongue. The musculature of the tongue blended into the normal pulp tissue, the pedicle being covered with squamous epithelium.

The phenomenon is explained by presuming the tongue had been caught and held to the exposed pulp between the wired, broken, deciduous teeth. Thus the raw area of the tongue and the immobilization necessary were both provided.

Deaths

Alters, Roland E., Dallas, Texas; University of Iowa College of Dentistry, 1928; died February 16; aged 54.

Anderson, Preston T., Mountain Home, Tenn.; Vanderbilt University School of Dentistry, 1916; died February 9; aged 65.

Baker, Elmer G., Chicago; Northwestern University Dental School, 1917; died February 26; aged 61.

Barlow, William A., Chicago; Northwestern University Dental School, 1923; died December 29, 1956; aged 67.

Beissel, William J., Jr., Massapequa, L. I., New York; New York College of Dentistry, 1917; died January 20; aged 60.

Boatwright, Howard L., Newport News, Va.; Medical College of Virginia School of Dentistry, 1914; died February 14; aged 64.

Brown, James E., Palmyra, N. J.; University of Pennsylvania School of Dentistry, 1918; died February 22; aged 61.

Burns, Ollie O., Inglewood, Calif.; North Pacific College of Oregon School of Dentistry, Portland, 1931; died February 19; aged 56.

Byrnes, Sidney J., Rutherford, N. J.; College of Dental and Oral Surgery, New York, 1919; died February 13; aged 64.

Campbell, John B., Lynbrook, N. Y.; University of Pennsylvania School of Dentistry, 1917; died February 3; aged 71.

Carruthers, George C., Springfield, Ill.; University of Louisville School of Dentistry, 1892; died February 14; aged 83.

Cline, Russel M., South Bend, Ind.; Indiana University School of Dentistry, 1926; died February 20; aged 61.

Coberth, Morris E., Baltimore; Baltimore College of Dental Surgery, University of Maryland, 1927; died February 2; aged 55.

Conboy, William H., Cheboygan, Mich.; Detroit College of Medicine, Department of Dental Surgery, 1901; died January 26; aged 83.

Cook, Jean G., Valparaiso, Ind.; Northwestern University Dental School, 1922; died December 24, 1956; aged 57.

Cornish, Alexander, Philadelphia; Pennsylvania College of Dental Surgery, Philadelphia, 1894; died February 24; aged 89.

Craner, Herbert E., Portland, Ore.; North Pacific College of Oregon School of Dentistry, Portland, 1923; died February 14; aged 60.

Culhane, Andrew B., Rockford, Ill.; Chicago College of Dental Surgery, Loyola University, 1901; died February 23; aged 81.

Curry, Paul J., Santa Monica, Calif.; University of Iowa College of Dentistry, 1914; died February; aged 67.

De Groff, Paul B., Stillman Valley, Ill.; Northwestern University Dental School, 1903; died February 15; aged 76.

Dearborn, Helen T., Red Oak, Iowa; Northwestern University Dental School, 1904; died March 1; aged 77.

Delmore, Hubert F., San Diego; Northwestern University Dental School, 1911; died February 11; aged 67.

Dinneen, James P., Ogden, Utah; Creighton University College of Dentistry, 1910; died December 17, 1956; aged 72.

Duchow, Richard U., Cutchogue, L. I., New York; New York University College of Dentistry, 1927; died March 18, 1956; aged 56.

Dunning, Henry S., New Canaan, Conn.; New York College of Dentistry, 1904; died February 10; aged 76.

Eisner, Samuel S., New York; New York College of Dentistry, 1904; died February 26; aged 78.

Elder, John C., Ravenswood, W. Va.; Ohio College of Dental Surgery, University of Cincinnati, 1902; died February 19; aged 77.

Ellis, Richard, White Plains, N. Y.; Pennsylvania College of Dental Surgery, Philadelphia, 1899; died February 4; aged 78.

Ewy, Henry H., Seattle; University of Minnesota College of Dentistry, 1914; died February 12; aged 67.

Figler, Samuel, Chelsea, Mass.; Tufts University School of Dental Medicine, 1933; died February 12; aged 49.

Ford, Arthur C., Hodgenville, Ky.; University of Louisville School of Dentistry, 1925; died February 22; aged 68.

Fraser, Alfred R., Fort Lauderdale, Fla.; University of Pittsburgh School of Dentistry, 1934; died November 29, 1956; aged 45.

Frenzel, Charles H., Brooklyn; New York University College of Dentistry, 1923; died January 22; aged 68.

Friedland, Louis, Brooklyn; College of Dental and Oral Surgery, New York, 1914; died January 27; aged 75.

Gould, Orrie L., Waco, Texas; University of Tennessee College of Dentistry, 1899; died February 17; aged 84.

Greenwell, Earl E., Ogden, Utah; University of Pennsylvania School of Dentistry, 1909; died February 19; aged 75.

Gsell, Harvey M., Wichita, Kan.; Philadelphia Dental College, 1903; died February 7; aged 75.

Gudath, Ernest A., Tampa, Fla.; Harvard University Dental School, 1924; died February 3; aged 67.

Hagan, Ernest R., Arlington, Va.; Columbian University Dental Department, 1903; died November 29, 1956; aged 85.

Hagerty, James P., Newark, N. J.; University of Pennsylvania School of Dentistry, 1901; died February 14; aged 86.

Hamer, Ralph W., Indianapolis; died February 6; aged 66.

Handy, John P., Long Prairie, Minn.; University of Minnesota College of Dentistry, 1894; died February 2; aged 84.

Havey, William H., Waltham, Mass.; Boston Dental College, 1899; died February 22; aged 82.

Horovitz, Morris, Los Angeles, Calif.; University of Southern California College of Dentistry, 1923; died February; aged 69.

Horton, George L., Auburn, N. Y.; University of Buffalo School of Dentistry, 1899; died February 10; aged 79.

Housel, William A., Broken Bow, Neb.; Lincoln Dental College of Cotner University, 1905; died January 28; aged 81.

Ingalls, Byron G., Belmont, Mass.; Tufts University School of Dental Medicine, 1906; died March 2; aged 75.

Jackson, Zellick, Worcester, Mass.; Tufts University School of Dental Medicine, 1923; died February 14; aged 59.

Jacobs, Bernard E., Memphis, Tenn.; College of Dental and Oral Surgery, New York, 1922; died February 23; aged 58.

Johnson, James W., Atlanta, Ga.; died January 22, 1956; aged 86.

Johnston, Edmund M., Riverside, Calif.; College of Physicians and Surgeons, San Francisco, 1912; died February; aged 69.

Kaufman, Harry S., Los Angeles, Calif.; University of Southern California College of Dentistry, 1928; died February 15; aged 52.

Kerr, Ralph M., Sidney, Ohio; Ohio College of Dental Surgery, University of Cincinnati, 1915; died March 4; aged 63.

Koval, Joseph, Cleveland; Western Reserve University College of Dentistry, 1927; died February 23; aged 56.

Lamb, Roscoe G., Chevy Chase, Md.; Georgetown University School of Dentistry, 1924; died January 31; aged 59.

Lancaster, Ralph B., Boston; Harvard University Dental School, 1925; died February 19; aged 57.

Leighton, Emmet G., Minneapolis; University of Minnesota College of Dentistry, 1917; died January 22; aged 64.

Leider, Solomon J., Campbell, Calif.; University of California College of Dentistry, 1923; died February 12; aged 55.

Levbarg, George J., Woodside, N. Y.; New York College of Dentistry, 1918; died February 1; aged 63.

Lewis, Stanley J., Cleveland; Western Reserve University College of Dentistry, 1930; died February 12; aged 53.

Lindley, Mahson R., Alton, Ill.; Chicago College of Dental Surgery, Loyola University, 1897; died January 29; aged 88.

Marcus, Callie K., Paterson, N. J.; George Washington University Dental Department, 1920; died February 14; aged 61.

Masters, George L., Connersville, Ind.; Indiana Dental College, 1904; died January 18; aged 74.

McCoy, Birch L., High Island, Texas; died November 17, 1956; aged 77.

McCready, John R., Los Angeles; Ohio College of Dental Surgery, Dental Department, University of Cincinnati, 1901; died December 11, 1956; aged 74.

McPhail, Archibald J., Berkley, Mich.; Central College of Dentistry, Indianapolis, 1901; died February 5; aged 79.

Metivier, Lucien M., Chicopee Falls, Mass.; Tufts University School of Dental Medicine, 1924; died February 4; aged 54.

Moelmann, Edwin H., Chicago; Chicago College of Dental Surgery, Loyola University, 1898; died February 4; aged 80.

Murstein, Myron M., Sharon, Pa.; University of Pittsburgh School of Dentistry, 1924; died February 13; aged 61.

Neil, Walter L., Rapid City, S. D.; Chicago College of Dental Surgery, Loyola University, 1898; died October 10, 1956; aged 87.

Newton, Francis J., Hammond, Ind.; Northwestern University Dental School, 1917; died December 19, 1956; aged 62.

Parker, W. Morse, Medford, Mass.; Harvard University Dental School, 1898; died February 5; aged 84.

Peront, Arthur A., Lawrence, Mass.; Baltimore Medical College Dental Department, 1906; died January 30; aged 76.

Pershing, Royal S., Lubbock, Texas; Northwestern University Dental School, 1901; died February 11; aged 82.

Pomije, William A., Shakopee, Minn.; University of Minnesota College of Dentistry, 1921; died December 7, 1956; aged 58.

Primas, Hugh R., Pittsburgh; University of Pittsburgh School of Dentistry, 1924; died February 9; aged 55.

Pumphrey, Thomas W., Arlington, Va.; Medical College of Virginia School of Dentistry, 1922; died February 17; aged 60.

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Prosthodontics, Partial: Douglas H. Yock, School of Dentistry, University of Minnesota, Minneapolis

Public Health Dentistry: Rulon W. Openshaw, 6703 Melrose Ave., Los Angeles

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Roentgenology: Donald T. Waggener, 800 S. 13th St., Lincoln, Neb.

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION

222 East Superior Street, Chicago 11, Illinois

WHitehall 4-6730

LON W. MORREY, *Editor* JOHN J. HOLLISTER, *Business Manager*

All expressions of opinion and all statements of supposed fact are published on the authority of the writer over whose signature they appear and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association. Articles are accepted with the understanding that they have not been published previously and that they are submitted solely to The Journal. The Journal of the American Dental Association is indexed in the Index to Dental Literature, in the Current List of Medical Literature and, in part, in the Quarterly Cumulative Index Medicus, Biological Abstracts and Chemical Abstracts.

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Announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

Ninety-Eighth Annual Session	Nov. 4-7, 1957	Miami, Fla.
Ninety-Ninth Annual Session	Nov. 10-13, 1958	Dallas, Texas
One-Hundredth Annual Session	Sept. 21-24, 1959	New York
One-Hundred and First Annual Session	Oct. 17-20, 1960	Los Angeles
One-Hundred and Second Annual Session	Oct. 16-19, 1961	Philadelphia

MEETINGS OF CONSTITUENT SOCIETIES

State	Date	Place	Secretary	Address
Alabama	Apr. 24-26, 1958	Montgomery	C. R. Crook	Professional Center, Montgomery
Alaska			C. L. Polley	Box 1896, Juneau
Arizona			W. G. Burke	17 E. Weldon Ave., Phoenix
Arkansas	Apr. 13-16, 1958	Little Rock	D. M. Hamm	Box 89, Clarksville
California	Apr. 20-23, 1958	San Francisco	W. J. Healy	450 Sutter St., San Francisco
S. California	Apr. 14-16, 1958	Los Angeles	S. M. Silverman	903 Crenshaw Blvd., Los Angeles 19
Colorado	Oct. 6-9	Colorado Springs	G. H. Jackson	724 Republic Bldg., Denver
Connecticut	May 14, 15, 1958	Hartford	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware			A. G. Schiek	3716 Philadelphia Pike, Claymont
District of Columbia	Mar. 9-12, 1958	Washington	J. F. Keaveny	1029 Vermont Ave., N.W., Washington
Florida	May 18-21, 1958	Miami Beach	G. J. Perdigon	17 Davis Blvd., Tampa
Georgia	Sept. 29-Oct. 2	Atlanta	J. W. Yarbrough	Southern United Bldg., Macon
Hawaii			J. H. Dawe	810 N. Vineyard St., Honolulu
Idaho	May 1958	Boise	G. L. Williamson	1003½ Main St., Boise
Illinois	May 11-14, 1958	Springfield	P. W. Clopper	632 Jefferson Bldg., Peoria
Indiana			W. R. Shoemaker	Citizens Bank Bldg., Anderson
Iowa	May 5-7, 1958	Des Moines	H. I. Wilson	Insurance Exchange Bldg., Des Moines
Kansas	May 5-8, 1958	Kansas City, Mo.	F. A. Richmond	Brotherhood Bldg., Kansas City 1
Kentucky	Mar. 23-26, 1958	Louisville	A. B. Coxwell, Jr.	2208 Dundee Rd., Louisville
Louisiana	Apr. 9-12, 1958	Monroe	J. S. Bernhard	2515 Line Ave., Shreveport
Maine			S. M. Gower	Box 27, Skowhegan
Maryland	May 4-7, 1958	Baltimore	C. L. Inman, Jr.	Medical Arts Bldg., Baltimore
Massachusetts	May 4-7, 1958	Boston	H. E. Tingley	12 Bay State Rd., Boston 15
Michigan	Apr. 28-30, 1958	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Apr. 14-16, 1958	St. Paul	C. V. E. Cassel	2236 Marshall Ave., St. Paul 4
Mississippi	June 9-11, 1958	Biloxi	B. A. Cohen	500-E E. Woodrow Wilson Dr. Jackson 27
Missouri			E. D. Suggett	Merchants Bank Bldg., Jefferson City
Montana	May 1-3, 1958	Butte	R. C. Ritter	28 N. Black St., Bozeman, Mont.
Nebraska	Apr. 28-30, 1958	Omaha	F. A. Pierson	Federal Securities Bldg., Lincoln
Nevada	June 1958	Reno	O. M. Seifert	755 Ryland Ave., Reno
New Hampshire			F. E. Williams	814 Elm St., Manchester
New Jersey	May 18-21, 1958	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico			J. S. Eilar	7 Medical Arts Sq., N.E., Albuquerque
New York			C. A. Wilkie	1 Hanson Pl., Brooklyn 17
North Carolina	May 4-7, 1958	Pinehurst	L. H. Butler	Jefferson Bldg., Greensboro
North Dakota	May 4-7, 1958	Bismarck	J. H. Pfister	419½ Dakota Ave., Wahpeton

State	Date	Place	Secretary	Address
Ohio	Oct. 6-9	Columbus	E. G. Jones	185 E. State St., Columbus
Oklahoma	Apr. 20-23, 1958	Oklahoma City	L. D. Wright	Osler Bldg., Oklahoma City
Oregon	Mar. 3-5, 1958	Portland	T. D. Holder	Selling Bldg., Portland
Panama Canal Zone		Ancon	W. R. Bond, Jr.	Ft. Kobbe Dental Clinic, Ft. Kobbe
Pennsylvania	May 21-23, 1958	Harrisburg	M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico	January 1958		R. Borges	Box 843, Arecibo
Rhode Island	Jan. 28, 29, 1958	Providence	W. F. Decesare	216 Broadway, Providence
South Carolina	May 11-13, 1958	Myrtle Beach	J. E. Wallace	1420 Gregg St., Columbia
South Dakota	May 11-13, 1958	Mitchell	R. E. Decker	Box 308, Parker
Tennessee	May 12-15, 1958	Chattanooga	K. P. Ezell	116 N. Academy, Murfreesboro
Texas	May 3-6, 1959	San Antonio		3707 Gaston Ave., Dallas 10
Utah			R. C. Dalgleish	State Capitol Bldg., Salt Lake City
Vermont			E. H. Van Santvoord	22 Washington St., Rutland
Virginia	May 4-7, 1958	Richmond	W. T. McAfee	Colonial National Bank Bldg., Roanoke
Washington	Mar. 31-Apr. 2, 1958	Seattle	W. P. Brust	211 Medical & Dental Bldg., Seattle
West Virginia	July 21-24	White Sulphur Springs	G. N. Casto, Jr.	710½ Lee St., Charleston
Wisconsin	Apr. 21-23, 1958	Milwaukee	H. O. Hoppe	1331 W. Vliet St., Milwaukee
Wyoming			T. J. Drew	State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Alabama			W. L. McCarty	Professional Center, Montgomery
Alaska	July 9-12*†	Anchorage	R. H. Williams	Box 2122, Juneau
Arizona			W. G. Biddulph	1502 W. Osborn Rd., Phoenix
Arkansas			W. T. Jones	107 E. Shelton, Monticello
California	July 29	San Francisco	D. R. Grant	507 Polk St., San Francisco
Colorado			R. F. Gilmore	Republic Bldg., Denver 2
Connecticut			C. G. Brooks	302 State St., New London
Delaware			P. K. Musselman	143 W. Main St., Newark
District of Columbia	Jan. 6-10, 1958	Washington	W. T. Birthright	1835 Eye St., N.W., Washington
Florida	July 8-18*†	Jacksonville	R. P. Taylor, Jr.	P. O. Box 2913, Jacksonville 3
Georgia			W. G. Brown	Blackshear
Hawaii	Aug. 29-Sept. 2*†	Honolulu	J. Y. Ing	210 James Campbell Bldg., Honolulu
Idaho			A. G. DeWinter	Sun Bldg., Boise
Illinois			W. A. McKee	Wood Bldg., Benton
Indiana			C. A. Frech	Gary National Bank Bldg. Gary
Iowa			P. A. Hahn	Farmers & Merchants Bank Bldg., Burlington
Kansas			G. L. Teall	Box 71, Hiawatha
Kentucky			J. J. Kelly	102 W. Madison St., Franklin
Louisiana			R. C. Steib	Maison Blanche Bldg., New Orleans
Maine			A. S. Appleby	Box 260, Skowhegan
Maryland			H. Levin	3429 Park Heights Ave., Baltimore 15
Massachusetts			A. M. Bommer	349 Broadway, Revere
Michigan			J. L. Champagne	3714 W. McNichols Rd., Detroit 21
Minnesota			M. G. Walls	Lowry Bldg., St. Paul
Mississippi			J. C. Boswell	Medical Arts Bldg., Jackson
Missouri			R. R. Rhoades	Central Trust Bldg., Jefferson City
Montana			R. O. Betzner	303 Power Block, Helena
Nebraska			H. E. Weber	Stuart Bldg., Lincoln
Nevada			A. A. Cozzalio	130 N. Virginia, Reno
New Hampshire			S. G. Markos	8 Renaud Ave., Dover
New Jersey			C. J. Schweikhardt	150 E. State St., Trenton 8
New Mexico			J. J. Clarke, Sr.	Artesia
New York	July 1, 2, 9-12*‡ July 1, 2, 9, 10†‡ Dec. 10-13*‡		D. W. Beier	23 S. Pearl St., Albany 7

State	Date	Place	Secretary	Address
North Carolina			J. H. Guion	Doctors Bldg., Charlotte 7
North Dakota	July 8-12	Fargo	T. M. Flath	312 Main St., Williston
Ohio			D. E. Bowers	322 E. State St., Columbus 15
Oklahoma			W. E. Cole	2420 N. Meridian, Oklahoma City
Oregon			F. L. Utter	Pioneer Trust Bldg., Salem
Pennsylvania			R. E. V. Miller, Sr.	Dept. of Public Instruction, Box 911, Harrisburg
Puerto Rico			J. Mercado C.	Comercio St. #452, San Juan
Rhode Island			F. M. Hackett	267 Academy Ave., Providence
South Carolina			J. L. Gunter	1226 Pickens St., Columbia 1
South Dakota			H. T. Aker	Canton
Tennessee			C. R. Aita	Bennie-Dillon Bldg., Nashville
Texas			R. T. Weber	Capitol National Bank Bldg., Austin 16
Utah			A. Ridge, Jr.	10 S. Second E., Provo
Vermont			P. M. Fitch	Newport
Virginia			J. M. Hughes	Medical Arts Bldg., Richmond
Washington			F. S. Rotchford	1108 S. Washington St., Olympia
West Virginia			C. C. Cottrill	Box 111, Glen Rogers
Wisconsin			S. F. Donovan	Tomah
Wyoming			W. A. Hocker	O & S Bldg., Casper

Most states require applications to be in 30 days prior to examination date.
*Dental examination. †Dental hygiene examination. ‡Write to secretary of dental examining board for information on locations of examinations.

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secy. or Chm.	Address
American Academy of Gold Foil Operators	Nov. 1, 2	New Orleans	R. B. Wolcott Secy.	Navy Dental Tech. School, Naval Training Center, San Diego, Calif.
American Academy of Implant Dentures	Nov. 2-4	Miami, Fla.	P. S. Loechler Secy.	540 N. California, Stockton, Calif.
American Academy of Oral Roentgenology	Nov. 1, 2	Miami Beach, Fla.	H. M. Berry, Jr. Secy.	4001 Spruce St., Philadelphia 4
American Academy of Periodontology	Oct. 31-Nov. 2	Miami, Fla.	C. E. Chamberlain Secy.	1101 N. North St., Peoria, Ill.
American Association of Dental Examiners	Nov. 1, 2		C. A. Bumstead Secy.	Stuart Bldg., Lincoln, Neb.
American Board of Oral Pathology	Dec. 7, 8		D. A. Kerr Secy.	University of Michigan, School of Dentistry, Ann Arbor, Mich.
American Board of Pedodontics	July 25-27	San Francisco	R. L. Ireland Secy.	College of Dentistry, University of Nebraska, Lincoln 8, Neb.
American College of Dentists	Nov. 3	Miami Beach, Fla.	O. W. Brandhorst Secy.	4221 Lindell Blvd., St. Louis 8
American Dental Assistants Association	Nov. 4-7	Miami Beach, Fla.	M. L. Martin Exec. Secy.	First National Bank Bldg., LaPorte, Ind.
American Dental Society of Europe	Aug. 28-31	Lausanne, Switzerland	J. P. Molony Secy.	110 Harley St., London W. 1, England
American Denture Society	Nov. 1-3	Miami Beach, Fla.	V. L. Steffel Secy.	College of Dentistry, Ohio State University, Columbus, Ohio
American Institute of Dental Medicine	Oct. 13-17	Palm Springs, Calif.	M. G. Lewis Exec. Secy.	2240 Channing Way, Berkeley 4, Calif.
American Public Health Association	Nov. 11-15	Cleveland	R. M. Atwater Exec. Secy.	1790 Broadway, New York, 19
American Society for the Advancement of General Anesthesia in Dentistry	Oct. 28	New York	M. H. Feldman Exec. Secy.	730 Fifth Ave., New York, 19
American Society of Oral Surgeons	Oct. 30-Nov. 2	Miami Beach, Fla.	A. B. Coxwell Exec. Secy.	2208 Dundee Rd., Louisville 5, Ky.
Asociacion Odontologica Argentina, Thirteenth Jornadas	Oct. 14-17	Buenos Aires	J. M. Lueje Secy.	959 Junin, Buenos Aires, Argentina
British Dental Association	July 1-5	Newcastle on Tyne, England	H. P. Buchanan Secy.	13 Hill St., Berkeley Square, London W. 1, England

Name	Date	Place	Secy. or Chm.	Address
Chicago Dental Society	Feb. 2-5, 1958	Chicago	K. S. Richardson Exec. Secy.	30 N. Michigan Ave., Chicago
Council on Dental Education, Dental Aptitude Tests	Oct. 4, 5		S. Peterson Secy.	222 E. Superior St., Chicago
European Orthodontological Society	Aug. 29-Sept. 2	Geneva, Switzerland	E. Fernex	1 Place du Port, Geneva, Switzerland
Federation Dentaire Internationale 45th Annual Meeting	Sept. 6-14	Rome, Italy	G. H. Leatherman Secy. Gen.	35, Devonshire Pl., London, W. 1., England
Fifteenth Congres Francais de Stomatologie	Sept.	Paris, France	J. Bara Gen. Secy.	30, Ave. Felix Faure, Paris 15, France
Greater New York Dental Meeting	Dec. 9-13	New York	I. Teich Secy.	Hotel Statler, New York, 1
Mexican Dental Association, Fourth Congress	Nov. 10-14	Mexico City	E. Martinez R. Secy.	Sinaloa 9, Mexico, D.F.
Mid-Continent Dental Congress	Nov. 17-20	St. Louis	J. E. Brophy Exec. Secy.	8013 Maryland Ave., St. Louis 5
National Board of Dental Examiners	Dec. 2, 3		G. J. Casey Secy.	222 E. Superior St., Chicago
National Dental Association	Aug. 4-8	Hot Springs, Ark.	J. A. Jackson Secy.	P.O. Box 197, Charlottesville, Va.
New England Dental Society	Oct. 16, 17	Boston	F. L. Finley, Jr. Secy.	43 Farmington Ave., Hartford, Conn.
New Orleans Dental Conference	Nov. 10-14	New Orleans	E. Burvant Secy.	Maison Blanche Bldg. New Orleans
Northeastern Society of Orthodontists	Oct. 21, 22	Buffalo	D. Mossberg Secy.	36 Central Park S., New York
Norwegian Dental Association, Annual Meeting	Oct.	Oslo, Norway	K. Gard Secy.	Incognitogatan 17, Oslo, Norway
Odontologica Federation of Central America and Panama	Sept. 11-14	Guatemala, C.A.	A. Hurtarte E. Secy.	4a Avenida No. 12-47, Zona 1, Guatemala, C.A.
Osterreichische Zahnarztetagung	Oct.	Krems/Niederosterreich, Austria	H. Kränzl	25a Währingerstrasse, Vienna 9, Austria
Pacific Coast Dental Conference	Aug. 19-22	San Diego	C. W. Gilman Secy.	219 E. 8th St., National City, Calif.
Pacific Coast Society of Prosthodontists	Aug. 15-17	San Diego	A. W. Spaulding Secy.	4350 11th Ave., Los Angeles 8
Thirty-First Journees Dentaires Internationales de Paris	Nov. 25-Dec. 1	Paris, France	R. Ibos	14 Ave. Gabriel-Peri, Antony, Seine, France
Twelfth International Dental Congress	Sept. 7-14	Rome, Italy	P. Lalli Secy. Gen.	Via Boezio 16, Rome, Italy

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CLASSIFIED ADVERTISING

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American Dental Association
222 E. Superior Street
Chicago 11, Ill. Box.....
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PRACTICES AND OFFICES FOR SALE AND RENT

CALIFORNIA—Glendale. For rent. Partitioned suite in attractive medical arts building, 210 N. Central Ave. $165 per month. Phone Citrus 1-1188 or Chapman 5-2100.

•

CONNECTICUT—For sale. Modern dental office and excellent practice located in shopping center in one of the most rapidly growing towns in Hartford area. Reasonable terms. Retiring because of health. Address A.D.A. Box No. 658.

•

CONNECTICUT—Outskirts of New Haven. Modern equipment. Average 12 patients daily. Includes fixtures, furniture, plumbing, etc. Schools near by. Rent low. Am going into graduate training. Address A.D.A. Box No. 692.

•

CONNECTICUT—For sale. Fully equipped, modern office, all Ritter equipment, including x-ray and motor driven chair. Located in Connecticut about 33 miles from New York City. Office and building completely air conditioned. Address A.D.A. Box No. 668.

•

CONNECTICUT—For sale. Three-chair modern, general practice dental office in air-conditioned building. $15,000; terms. Dentist, age 47, will stay with buyer for six months and share expenses, refer patients and then retire to Florida. Address A.D.A. Box No. 534.

•

FLORIDA—Coral Gables. Two operating room dental suite; one fully equipped. Buy or rent equipment with office. Wonderful opportunity. Warren Zundell, M.D., 101 Majorca Ave., Coral Gables, Fla.

•

FLORIDA—Two-chair new dental office and apartment absolutely rent free to right dentist with Florida license, until established, then reasonable. Archie Edwards, 2030 Oak Terrace, Sarasota, Fla., Ringling 7-3862.

•

FLORIDA—For sale. Corner modern construction duplex dental office building and practice on central east coast. Office newly equipped 1953, Ritter Motor chair, Trident unit, G.E. x-ray, American cabinet, etc. Adjoining office is furnished apartment for dentist's use, or can be rented for income. Address A.D.A. Box No. 667.

ILLINOIS—Office for rent in Nauvoo. Dental office available, excellent location, second floor of State Bank Bldg.; $50 per month including heat and water. No other dentist in town, prosperous community, offers wonderful opportunity. Present equipment can be bought at a very nominal figure. Contact State Bank of Nauvoo, Nauvoo, Ill.

•

ILLINOIS—For sale. Dentist deceased. Physician's residence and office. Two apartment brick building, two car garage, landscape garden. All glass extension to house suitable for physician or dentist. Reasonable terms. 1426 Rosemont Ave., Chicago, Ill.

•

ILLINOIS—Practice eight years old with modern equipment. Choice location southwest side of Chicago. Annual gross over $30,000. Low over-head. Am leaving state, but will stay and introduce. Dr. Joseph T. Kuschell, 1555 West 79th St., Chicago 20, Ill.

•

KANSAS—Wichita. For sale. General practice, modern two chair office, eight room suite, air conditioned, in shopping center. Nice clientele. Room for third chair. All inventory goes. Owner specializing. Address A.D.A. Box No. 687.

•

LOUISIANA—Lake Charles. For rent, or sale. Modern two-chair office. Medical area. Walk in — start practice. Mrs. O'Connor. Phone HE 9-5377.

•

MAINE—Dental office, modern fully equipped, two operating rooms, laboratory, reception room on ground floor in business building. Always busy practice, low rental. Priced very reasonable because of illness. Dr. James H. Cunningham, 35 Cottage St., Bar Harbor, Me.

•

MASSACHUSETTS—For sale. Dental office in industrial town in western Massachusetts. Two operating rooms, complete. Laboratory, reception room and business office. Retiring from practice. Will remain to introduce patients. Address A.D.A. Box No. 639.

•

MICHIGAN—Must sell immediately. Two chair dental office in southwestern Michigan. Resort area. Established 13 years. Town needs dentist badly. Spacious office. Low rent. Good Ritter equipment. For quick sale, all equipment, instruments and supplies—$4,000. Dr. Philip Olds, Van Buren State Bank Bldg., Hartford, Mich.

NEW JERSEY—Five year lease with option to buy or outright sale. Home-office combination. Active dental practice grossing over $20,000. Steadily growing. No competition. Must retire as soon as possible because of ill health. Address A.D.A. Box No. 680.

•

NEW YORK—For sale. Long established office, fully equipped, two motor chairs, modern and tastefully furnished for high type clientele in exclusive south shore Long Island. Owner ill. Asking $12,000. Address A.D.A. Box No. 634.

•

OHIO—For sale at inventory. Two-chair dental office in modern office building. Practice limited to oral surgery and exodontics for 35 years. Equipment modern and well maintained. Arrangement of office also ideal for general dentistry. Health requires retirement. Write to Second National Bldg., c/o Miss Liston, Akron 8, Ohio.

•

OHIO—For sale. Good practice in northern Ohio city of 30,000. Pastel Ritter unit, S. S. White chair and G. E. 90 x-ray. Very desirable and scenic location; has been dental office for a number of years. Cash selling price is the original cost of equipment. Dentist leaving to specialize. Address A.D.A. Box No. 674.

•

OREGON—Must sell practice and equipment by September. Modern fully equipped two-chair office in a beautiful western Oregon college town. Leaving to take graduate training in a specialty. Address A.D.A. Box No. 603.

•

PENNSYLVANIA—For rent. Fully equipped two-chair dental office in suburb of Lancaster, Pa. Equipment for sale or rent. Dentist retiring because of ill health. Address A.D.A. Box No. 605.

•

PENNSYLVANIA—For sale. Fully equipped office and practice in Erie, Pa. Owner's death, after 30 years' practice, necessitates sale. Inquire Mrs. E. J. Long, 3909 Sassafras St., Erie, Pa.

•

TEXAS—Dynamic Dallas. For rent. Completely equipped, spacious, two operating rooms with large laboratory, all air conditioned. In fast growing suburban area. Reasonable rent. Hurry! Guisinger Realty, 2410 S. Zangs Blvd., Dallas, Texas.

•

VIRGINIA—Will sublease five room, two-chair, air-conditioned office in growing community up to August 15th. Very comfortable income with hours to suit the dentist. Excellent fishing and hunting practically at your door step. Owner to specialize. Address A.D.A. Box No. 660.

•

VIRGINIA—For sale. Dental practice and equipment. Washington metropolitan area. Established 12 years. Gross $25,000 each year. Low overhead, good start for right man. Sell $2,500. Address A.D.A. Box No. 642.

OPPORTUNITIES AVAILABLE

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CALIFORNIA—Live near your practice? Or practice where you would like to live? Ideal conditions and comfortable California year-round temperatures are to be found on the San Francisco peninsula. Space is available in a new medical dental building, located in a booming area, 30 miles south of San Francisco. The building, to be completed this September, will be situated in a rustic setting adjacent to a newly developed shopping center. It is not too late to arrange suites laid out to your own specifications. Address A.D.A. Box No. 689.

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FLORIDA—Fort Lauderdale. Because of health limitations, I am seeking an associate well trained in general dentistry. Prefer reasonably mature man with a sensible outlook. Excellent opportunity to participate in good practice. Address A.D.A. Box No. 671.

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FLORIDA—Wanted: Dentist with Florida license for fully equipped, new, spacious, two-chair dental office in rapidly growing area, north central Florida. No rental, excellent opportunity for dentist willing to work. Thomas D. Head, M.D., Crawfordville, Fla.

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ILLINOIS—Young dentist wanted in a country town, population 600. Good farming and dairy country, new high school. Two-chair, four room office, modern, except x-ray. Practice established 46 years. Nothing to buy except x-ray. I will work part time for 40 per cent. Ground floor, one story office, no rent. Dr. G. I. Lewis, Dieterich, Ill.

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IOWA—Wanted: associate for general practice to eventually become partner. Address A.D.A. Box No. 691.

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KANSAS—Community seeks dentist. High-plains, wheatland community, population 700, seeks skilled dentist to share offices with M.D. in community medical building. Estimated gross, $15,000 up. Contact Box 277, Bird City, Kan.

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MASSACHUSETTS—Dentist wanted for part time practice at health center serving four towns in western Massachusetts. Complete office facilities and equipment provided gratis. Write: Worthington Health Assn., Worthington, Mass.

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MASSACHUSETTS—Hospital dentist. Active dental clinic. Administrator with oral surgical background desired. Salary range $6,812 - $8,684. Excellent vacation, sick leave, retirement, group insurance benefits. Active 300 bed hospital, 400 bed dormitory and outpati nt department. Apply to Commandant, Soldiers' Home, Chelsea 50, Mass.

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MICHIGAN—Dentist wanted. Excellent opportunity, area growing rapidly; 1,300 children in school, estimated population in seven mile radius—10,000. No dentists. Many lakes. Write Chamber of Commerce, Edwardsburg, Mich.

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MISSOURI—Associate wanted in very modern dental office or will sell. Town 20,000. Large trade territory. Could use more dentists here very nicely. Will make a good deal either way. Address A.D.A. Box No. 627.

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NEW JERSEY—Desirable location for professional man. Prominent corner—¾ of an acre. Beautifully landscaped, attractive colonial residence. First floor—large living room, fireplace, dining room, pine kitchen, large pine recreation room, fireplace and bath. Second floor: three bedrooms, tile bath. Hot water, oil heat, two car garage. $35,000. Kathryn Loeffler, Woodcliff Lake, N. J. Park Ridge 6-2405.

NEW YORK—Orthodontist wanted for exclusive New York state practice. New modern eight chair office. Graduate training in edgewise technic preferred. Excellent opportunity for man qualifying. Please send full details. Inquiries will be held in strict confidence. Address A.D.A. Box No. 664.

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NEW YORK—Oral surgeon desires associate. Excellent opportunity. Must have formal anesthesiology and oral surgery training. State qualifications, age, institutions of training, references. Address A.D.A. Box No. 676.

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NEW YORK—Client with substantial general practice seeks an associate, preferably interested in pedodontics. His offices are located in Westchester County, a community for pleasant living, with excellent schools, country clubs and outdoor recreations, less than one hour from Grand Central. Peyton Randolph Harris, 70 Pine St., New York 5, N. Y.

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NORTH DAKOTA—Good opportunity for dentist in small friendly North Dakota town. Large trade area, good high school. Excellent water and sewer system. Four churches. Office on main street. Low rent. Grenora Community Civic Improvement Assn., Mabyl Mortinson, Sec'y, Box 5, Grenora, N. D.

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OREGON—Excellent opportunity for dentist in new community clinic. Large trade area. Unopposed practice. Small town. Good schools and parks. Hunting and fishing. Near skiing and boating. Write Malin Clinic, Malin, Ore.

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SOUTH DAKOTA—Large prosperous farm trade territory, near Ft. Randall Dam, wonderful hunting, fishing and boating. Good town, paved streets, excellent school, on highway U.S. 18 and U.S. 281. Come and see for yourself. A real opportunity for a young dentist. Lake Andes, S. D. Address the Lake Andes Chamber of Commerce.

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TEXAS—Wonderful opportunity for dentist, fast growing area; 40 miles from Houston. Write Joe C. Yelderman, Needville, Texas.

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TEXAS—Oral surgery internship available July 1st, 1957 to June 30, 1958 at John Peter Smith Hospital, Fort Worth, Texas. City-county institution, excellent board approved training program, good climate. Apply directly to Administrator.

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●

General practitioner, age 34, desires permanent or temporary position Europe or Orient. Speaks French, some German. Two years' experience pedodontics. Military service completed. Unmarried. Address A.D.A. Box No. 696.

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Will be discharged from service November 1957, desirous of entering associate, group or partnership practice in New York State. Experienced all phases of general dentistry, high-speed, and hydrocolloid procedures. Reply Dental Surgeon, Dobbins A.F.B., Marietta, Ga.

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D. C. and Maryland licensed, 28, married, Georgetown graduate, internship Walter Reed. Oral surgeon, two years in 400 bed Army hospital in Germany. Also well trained and experienced in periodontics and prosthetics. Desire contact with well established practitioner D. C. area who seeks young associate with qualifications listed. Leave service September. Address A.D.A. Box No. 693.

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Diplomate, American Board Oral Surgery, desires academic association with a dental college. Oral surgery — basic sciences (Anatomy, Pathology) at undergraduate and postgraduate levels. Address A.D.A. Box No. 669.

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New York licensed, 36, with five years' general practice. B.A. and M.A. in education with teaching experience. Desires teaching position in dental college. Address A.D.A. Box No. 670.

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Dentist, age 28, military obligation completed, desires full time association, partnership, group practice or other salaried position. Will consider industrial or foreign opportunity. Address A.D.A. Box No. 672.

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New York licensed dentist desires location in suburban or small community, central or western New York state. Age 30, married, National Boards, one year hospital internship, two years' general practice, including prosthetics. Completing military service September 1957. Address A.D.A. Box No. 673.

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Georgia, Florida licensed 1955 Emory graduate desires to purchase or associate in established general practice. Prefers medium sized town or suburban location in a large city. Completing military service August 1957. Age 24, married. John H. Morgan, 106 W. Furlow St., Americus, Ga.

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Dentist, 30 years old, military service completed, married, no longer interested in private practice, desires position in sales or public relations with ethical dental manufacturer or retail dealer. Will relocate. Address A.D.A. Box No. 675.

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Industrious, young dentist, married, experienced in general dentistry and crown and bridge, interested in occlusal rehabilitation. Desires association or purchase of high caliber practice. Completing military service July 1957. Licensed Pa., New Jersey; will take other boards. Address A.D.A. Box No. 679.

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Oral surgeon, excellent training, desires association with qualified oral surgeon. Licensed in New Jersey and New York. Will take necessary state boards. Address A.D.A. Box No. 681.

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Associateship desired. 1956 graduate, just completed year's dental internship in A.D.A. approved hospital. Desires general practice with high standards, prefer large metropolitan area or nearby. Have Pennsylvania licensure, taking Florida board this month. Military obligation completed. Age 32, single. Address A.D.A. Box No. 683.

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Illinois licensed dentist completing military obligation in August is interested in an association in the Chicago area or city. Address A.D.A. Box No. 686.

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New York, Pennsylvania licensed, 1954 University of Pa. graduate. Married, veteran. Desires opportunity for pedodontic or general practice in upstate New York. Robert Kurtz, D.D.S., 1615 Avenue I, Brooklyn, N.Y.

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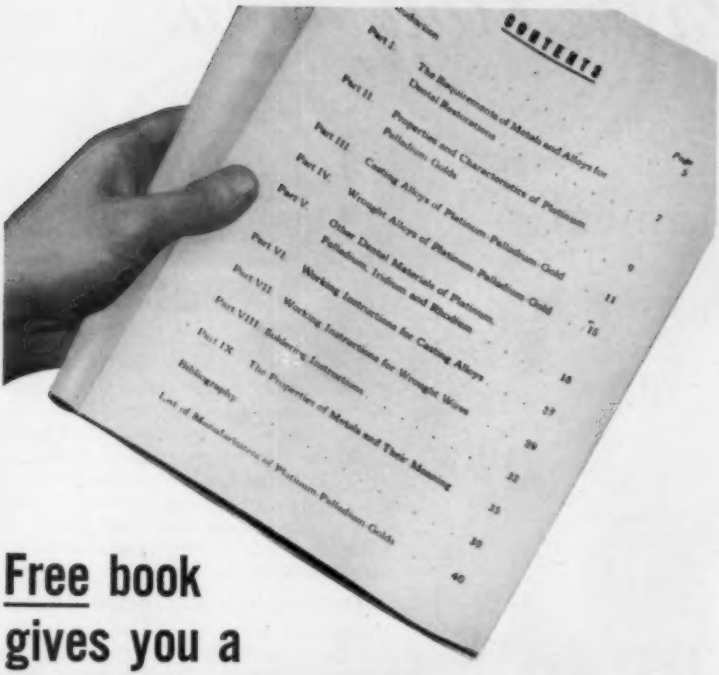
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A-26

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1. Kent-Jones, D.W.: Modern Cereal Chemistry, ed. 3, The Northern Publishing Co., Liverpool (1939).

2. Heupke, W., and Kolb, A.: Mechanism of the Beneficial Action of Alimentation of Oats in Diabetes, Deutsche Ztschr. Verdauungeskr. *13*:111 (1963).

DENTAL AUTHORITIES stress the importance of optimal nutrition in the aim toward better dental health during the early growth years. Oatmeal, with its wealth of essential nutrients, not only contributes broadly to good nutrition, but—since its carbohydrate is not readily degraded to simple fermentable sugars—is of virtually no cariogenic influence.

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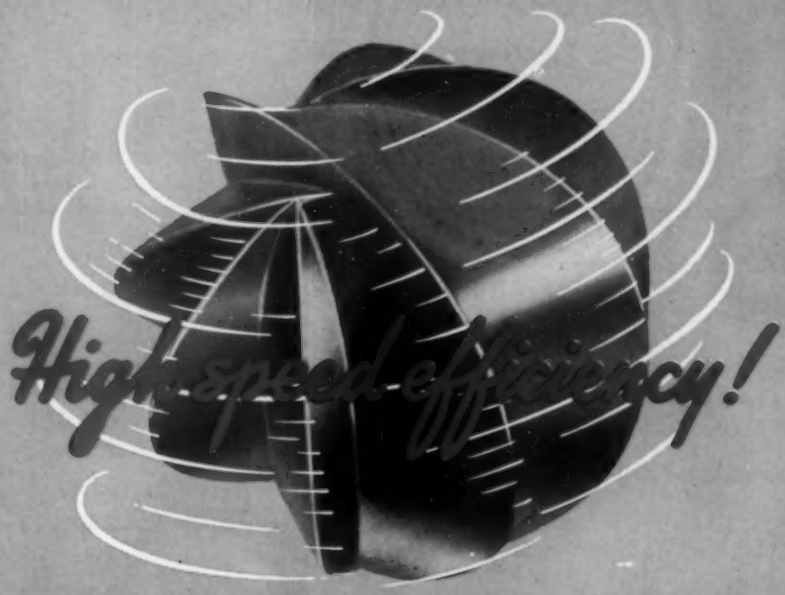

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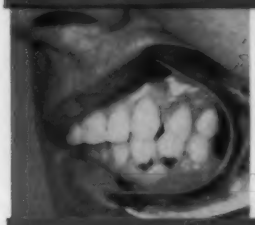

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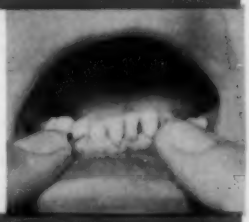

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[Council on Dental Health: J.Am.Dent.A. *47*:387 (Oct.) 1953].

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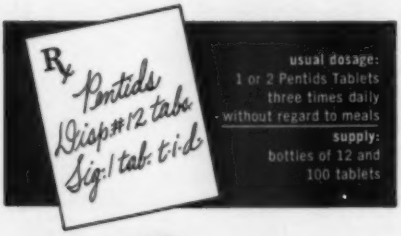

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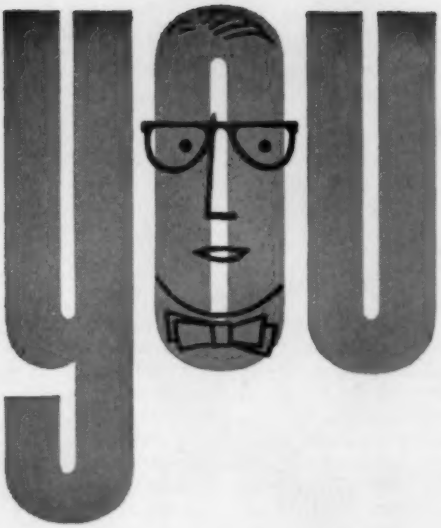

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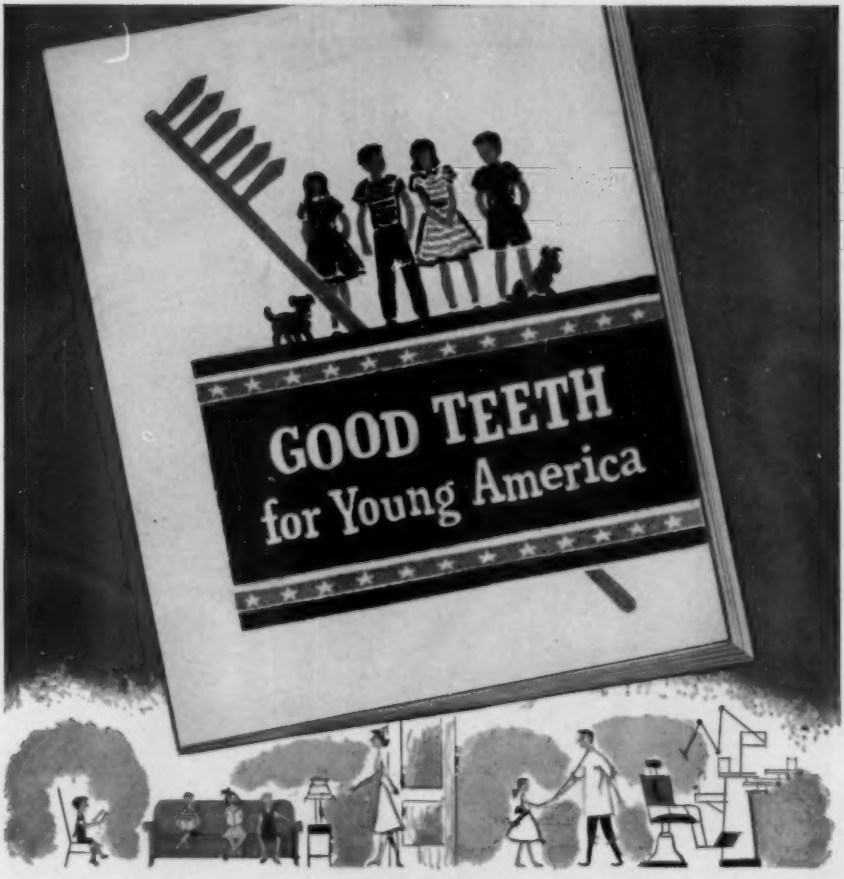

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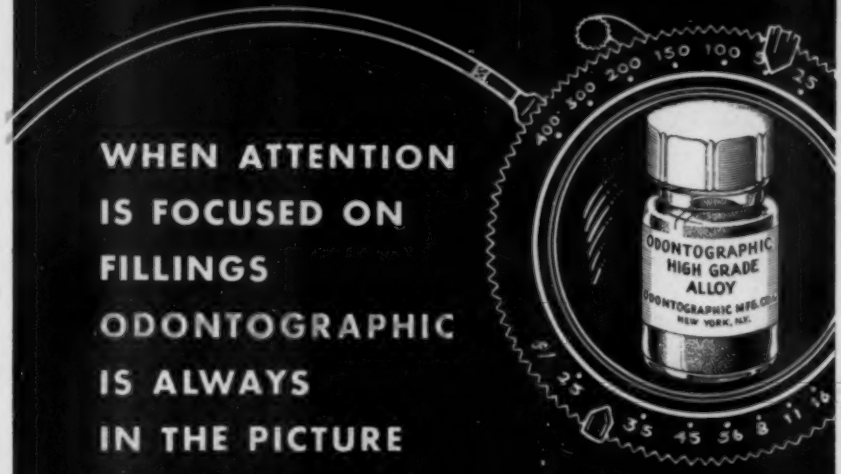

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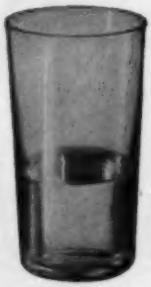

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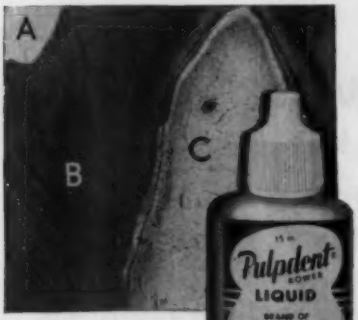

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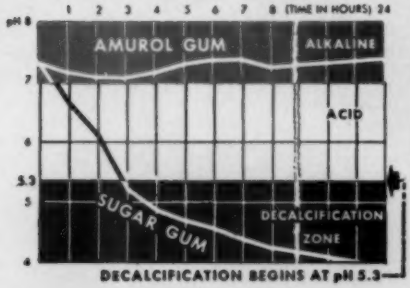

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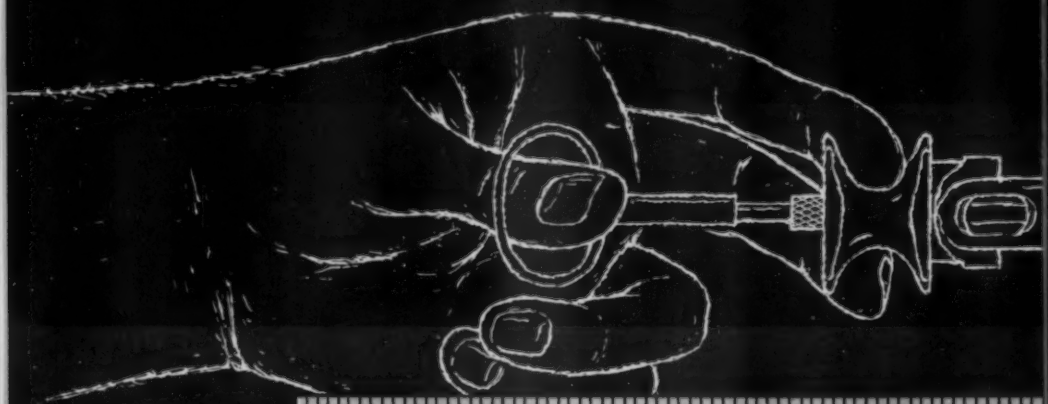

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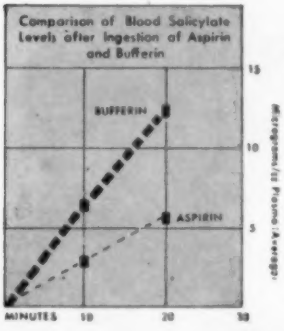

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